

## LAN-to-WAN connectivity services

How to navigate a bewildering array of telephone companies and services. **See page 48**

## Pentium PCs: 64-bit power close at hand

If your CPU is the bottleneck, take a look at these servers and desktops. **See page 58**

JULY 5, 1993

THE VOICE OF PERSONAL COMPUTING IN THE ENTERPRISE

VOLUME 15, ISSUE 27

## IBM's PS/2 splits into two lines

The Traditional line is aimed at large corporate customers looking for tried and tested technology, while the Enhanced line is for early adopters who want the latest in technology.



### Traditional

- Will work with widely available drivers and add-in cards
- Will have the SLC Blue Lightning (clock tripping chips)
- Will feature technologies of the Enhanced line as those technologies become widely accepted

### Enhanced

- Will be the first line in which these technologies appear:
- PS/2 E systems
- Ultima
- Pentium
- PowerPC

SOURCE: IBM

## IBM woos large PC sites with extensive service

BY CATE CORCORAN

NEW YORK — IBM will offer its Fortune 500 PC customers a level of support it has traditionally offered mainframe customers, the company said here at PC Expo last week.

The move was spurred in part by IBM's loss last year of major customers who defected to com-

petitors when they saw no value in paying extra for a PS/2, said Dave Andonian, director of premium brands at the IBM PC Co.

Called the Premium Partners Program, the effort is an extensive support package designed to help IBM's big customers deploy mission-critical systems,

**See IBM, page 79**

## Novell set to fix snags in its OS/2 Requester

BY VANCE MCCARTHY

Novell Inc. will dispatch to IBM within the next two weeks a new OS/2 Requester to replace a faulty version.

Since OS/2.1.1 and a new version of the NetWare requester began shipping a month ago, users have had trouble running Windows applications under OS/2.1.1 when their OS/2 desktops are connected to NetWare

2.x and 3.x servers. A requester is software code that links OS/2 clients to NetWare networks.

Other OS/2.1.1 NetWare problems include bung systems, inability to support memory dumps, and difficulty toggling between print and file access queues.

"The OS/2 2.1 requester doesn't work yet in the Win OS/2 environment," said Art

**See REQUESTER, page 79**

# Apple commits to license Mac OS for PowerPC, Intel

## Opens up proprietary OS in bid to dethrone Microsoft

BY TOM QUINLAN

NEW YORK — Apple Computer Inc. is finally throwing open the gates to its kingdom, promising for the first time to license the Macintosh operating system to other vendors for both the PowerPC and Intel x86 systems, an Apple official said here last week.

The move, which comes less than a week after Apple representatives said the company was undecided about licensing the System 7 operating system to other manufacturers, ends 16



years of Apple maintaining a proprietary architecture.

"We still have to make a lot of decisions about how to implement this, but we recognize that we have to license System 7 if we truly want to be more of a software company," said Rick Spitz, vice president of Macintosh system software.

Apple's speed in committing itself to becoming an open software company can be attributed to the ascension of Michael Spindler to CEO last month, sources said.

"John Sculley recognized that

this was necessary, but he really didn't want to deal with restructuring Apple's business model one more time," one source said. "Without Spindler, this decision probably wouldn't have been made now."

Apple's move toward becoming an operating systems company will change the complexion of future buying decisions, analysts say.

"This means that within two to three years, the Intel-Microsoft model won't completely dominate the market," said Aaron Goldberg, CEO of Santa Clara, Calif.-based InfoCorp.

**See APPLE, page 79**

## AppWare 'opens' to hard-hitting reviews

### Critics: Are we 'Waiting for Godot'?

BY VANCE MCCARTHY AND TORSTEN BUSSE

NEW YORK — Novell Inc.'s introduction here last week of AppWare — its ambitious plan for making network applications easier and faster to build — bore an uncanny resemblance to a rushed Broadway opening.

The audience loved the plot but said AppWare needs more backstage work if it's going to be a hit.

"AppWare is a great development environment, allowing us to create finished applications from modules as if you wrote all the code yourself," said Paul Bandrowski, manager of advanced technology at Sara Lee Corp., in Chicago.

"The majority of this technology exists today," Bandrowski said. "But for AppWare to take off, Novell has to better integrate these products and do a better job of explaining what AppWare means to developers."

Collectively, AppWare is an object-oriented development environment that consists of application-building tools from Series Corp. and cross-platform

**See APPWARE, page 79**



Novell's executive vice president John Edwards explains how AppWare 'will shield the complexity' of writing network applications.

## First pack of ODBC drivers finally shipping

BY SCOTT MACE AND DOUG BARNEY

Microsoft Corp.'s Open Database Connectivity (ODBC) ended its long shakedown cruise last week with the shipment of Q+E ODBC Pack 1.0 from Q+E Software Inc., formerly Pioneer Software Inc.

For the first time, using Q+E ODBC Pack, any ODBC-compliant application can easily tap into most popular LAN database servers. The product supports Oracle, SQL Base, dBase, NetWare SQL, SQL Server, Ingres, Informix, DB2/2, Paradox 4.0, and XDB.

Among the ODBC-compliant applications now shipping are Microsoft Access 1.1, Visual Basic 3.0, Lotus 1-2-3 4.0 for Windows, and ObjectView 2.0.

Lotus Improv 2.1, which ships July 19, includes a Q+E ODBC driver. In addition, any other Windows application capable of calling a Dynamic Link Library can access these ODBC drivers.

**See ODBC, page 79**

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## NEWS

## Excel, Word to share a 'common' future

Office apps to include Visual Basic

By STUART J. JOHNSON

NEW YORK — Users last week got a peek at Excel for Windows that share many common interface features and support Microsoft Corp.'s latest Object Linking and Embedding (OLE) technology.

As expected, chairman Bill Gates also announced at PC Expo that all of the company's office productivity applications soon will provide a version of Visual Basic as their common macro language. (See "Visual Basic to star as common macro language," June 28, page 1.)

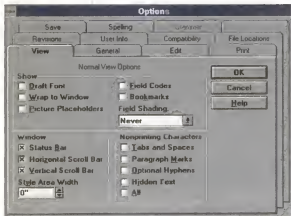
"[Visual Basic] will be built

into all of our high-end applications [and] will first ship in Excel," Gates said. Excel 5.0 and Project 4.0, set to ship this fall, will have the language, he said.

The version of Visual Basic, called Applications Edition, has been extended so it supports all the applications' objects. The language will be added first to Windows applications and later to Microsoft's Windows NT and Mac programs.

Microsoft also showed off Word for Windows 6.0, which will ship by year end, according to a company representative.

Word 6.0 was shown working with Excel through OLE 2.0's in-place editing capability.



Word 6.0's Tabbed dialog box give the user file-card-type choices for many features, letting them change options quickly.



Microsoft chairman Bill Gates demonstrated new versions of Word and Excel at PC Expo.

Users will also be able to link or embed data between applications by simply dragging marked data between the two applications and dropping it—doing away with clumsy copy-and-paste procedures in the Windows clipboard.

During Gates' Excel 5.0 demo, he also showed support for OLE 2.0's other major feature: the capability to automate tasks between applications.

The company is also working to further standardize the user interface between Excel, Word, and other Microsoft productivity applications. Eight of the nine drop-down menu items in the demo have the same name and location, and many of the toolbar icons are identical as well.

In addition, Word 6.0 will use the right mouse button to add drop-down menus for many Windows applications. Word will also provide WordPerfect 5.1 file compatibility and the capability to emulate WordPerfect's display. The WordArt mini-application that comes with Microsoft Publisher will also be included, the representative said.

The company did not disclose whether Word 6.0 will include Visual Basic when it ships.

## AT DEADLINE

## IBM doubles planned job cuts to 50,000 this year

IBM is sharpening its ax again to cut an additional 25,000 employees over the 25,000 it had planned to drop this year. The company is expected to announce the cuts—a combination of forced layoffs and early retirement packages—by the end of July, sources say.

The cuts could grow slightly larger depending on how sales in the company's European markets, which continue to be down, go for the rest of this year, sources said. The 50,000 cuts will bring the number of employees down to about 250,000 by year end, 157,000 fewer than the company had at its peak in 1986.

IBM chairman Louis Gerstner decided to cut aggressively in this round of layoffs, hoping it will be the last, the sources said. In so doing, Gerstner may avoid further rounds that might lower employee morale. An IBM representative refused to comment on the matter.

—Ed Scannell

## Boston judge upholds Quattro ruling

Federal District Court Judge Robert E. Keeton last week upheld his ruling that Borland International Inc.'s Quattro Pro violated Lotus 1-2-3 copyrights. After denying Borland's most recent state of defenses, the Boston judge set an August 19 hearing to schedule a trial at which will focus on damages. Borland has long planned to appeal if Keeton found in Lotus Development Corp.'s favor.

—Doug Barney

## Big Blue announces PowerPC division

IBM last week formally announced a division to produce and promote low-cost PowerPC-based systems. (See "Ailing IBM bets on RISC strategy," February 1, page 1.) Nuovo Mii, former head of IBM's entry systems technology division, will head the new group, which is connected to IBM's personal systems group.

IBM announced the new division as the company begins its PC technology development into an organization to be called the IBM PC Company Technology Center. The organization merges the entry systems technology group with the IBM PC Co.

—Ed Scannell

## Novell deal bundles Fast Ethernet

Novell Inc. NetWare users will get a boost in speed when LAN Performance Labs (LPL) of San Diego bundles the network operating system with its Fast Ethernet adapters. Novell and LPL will bundle the 16-bit ISA and 32-bit EISA adapters, which are the first 100Mb Fast Ethernet products on the market, and NetWare 4.0. The companies will sell the adapter bundle through Novell distributors and resellers and through networking and systems integrators.

—Jayne Wilson and Shawn Willett

## Approach 2.0 database offered at \$99

Lotus Development Corp. said it will offer its newly acquired Approach 2.0 database for \$99 through September 30. Lotus, which officially completed the acquisition of Redwood City, Calif.-based Approach Software Corp. last week, said users who take advantage of the offer will receive a free upgrade to the next version of Approach, which will be "Lotusized" with SmartIcons and other common Lotus "working together" features.

—Shawn Willett

## Intel to add 750 jobs; Tandy loses 500

Intel Corp. thinks it has found gold in California's hills. While other companies last week announced layoffs, the chip maker said it plans to add 750 new jobs at its Folsom, Calif., site. The company will break ground on a fifth building at the site in California's Gold Rush region and add the new employees in the next two to three years.

Prospects were not so good for 500 Tandy employees who will be laid off as a result of AXT Research Inc.'s purchase in May of the Fort Worth, Texas, company's computer manufacturing business. The cuts represent about a fifth of Tandy's computer manufacturing employees. More than 300 layoffs will occur nationally.

—Yvonne L. Lee

## Corel readies fix for CorelDraw 4 glitches

By JEANETTE BORZO

Corel Corp. said it will ship a maintenance release for CorelDraw 4 within two weeks to fix a number of problems, many of which center around the graphic package's use of Object Linking and Embedding (OLE) 2.0. "We will make sure these issues are taken care of quickly and effectively," said a representative of the Ottawa-based company. Free diskettes will be available to users who request them, she said.

Users of the Windows-based product, which has been praised for about a month, praising its extensive functionality but said they can't rely on the program for important jobs.

"I'm not going to give it up," said a user who requested anno-

nymity. "But I am a little scared of ending production work with it. It startles me sometimes by not doing what I expect."

Users complained the most of trouble with OLE 2.0. "CorelDraw 4's" features are astounding," said Rick Altman, host of the CorelDraw International User Conference. "But I have my share of crashes, which I can directly attribute to having OLE 2.0."

"We can't use CorelDraw until there is a broader support for OLE 2.0," said Ted Theoforatos, network administrator at National Evaluation Systems, in Amherst, Mass. "We deinstalled CorelDraw 4 and had to convert all the artwork we did back to CorelDraw 3."

Troubles with OLE 2.0 have made simple functions, such as

copying to the clipboard, a difficult task for some users.

"They have the best interface on the market, [but] I find it reprehensible that it takes 10 to 15 seconds to cut a rectangle into the clipboard," another CorelDraw user said.

Users also reported problems with color support, installing CorelDraw from the CD-ROM, printing, and support for .EPS files.

Users said Version 4 is not as huggy as CorelDraw 3 was when it shipped last year, but they added that Corel has taken on an overambitious development cycle.

"I don't consider this to be as big of an error as [Version] 3, but there is a widespread feeling that the software was introduced too soon," Altman said.





## Distributed Thinking / Stewart Alsop

## Bewitched, bedraggled: PC industry dances to customers' beat

When you work for a weekly newspaper and go to a major trade show, the first question people ask you is, "What's new?" There's some logic to this—traditionally, vendors introduce their products at trade shows, where they know there will be tens of thousands of potential customers on hand.

But at PC Expo last week, I was stumped for an answer. And so was everybody else, as far as I could tell. It was a giant show—800 exhibitors showing off products in giant booths with lots of razzle-dazzle. There were lots and lots of people there, more than 80,000 according to the organizers, and those people seemed happy and engaged by the product demonstrations. The only thing missing was the new products.

There were new versions of old products (Microsoft was previewing Microsoft Word 6.0) and product-line extensions (IBM showed its ThinkPad 350 subnotebook). And there were a couple of nearly new products that had been introduced in the past month or so, such as the Hewlett-Packard OmniBook 300 and Adobe Acrobat. (For more on PC

Expo, see our news coverage on page 8.)

Possibly the most leading-edge product introduced at PC Expo was Interactive Nightwatch, which is billed by its publisher, New Machine Publishing, as "the first interactive full-length adult movie." I would review it here, but *InfoWorld* isn't that kind of newspaper. To tell you the truth, I was worried that somebody would see me watching it and jump to the wrong conclusion, so I haven't seen much of the product and (I swear) I never actually interacted with it.

## Retailer Egghead

Discount Software introduced Egghead Express, an on-line ordering system that allows major accounts to assemble and submit orders directly to Egghead's AS/400 computers. This application, which was developed with Microsoft's Access product, is a far more commercial version of the kind of applications *InfoWorld* readers often create: one that binds customers and suppliers through information systems.

But underneath the dense crowds and

intense hoopla at PC Expo, the computer industry seems to be befuddled. For the past 15 years, trade shows have been graded as successful by how many hot new products were introduced there. New products were the key driver in the growth of the industry. Now the industry is growing rapidly: The major PC manufacturers are reporting growth rates of more than 25 or 30 percent; trade shows are attracting record crowds; hot new products are selling in greater volumes than their DOS counterparts and still growing fast.

In my conversations with the chief executives of these vendors, I get a distinct sense that they aren't certain what's driving the business anymore. Both hardware and software companies are getting a lot of their growth by cutting prices and their own profit margins. The hardware companies can't figure out how to make their products different from one another, which partly explains the dearth of new products. Microsoft and Intel seem to be the only companies

capable of determining their own future. The business appears to have changed in a fundamental way.

It wasn't until the end of the show that I figured it out: The customers are calling all the shots in personal computing. The vendors, who once used their prowess in engineering and technology to beat each other silly, are now having to learn to compete by being responsive to the customer. Scary, isn't it?

## PDA CONUNDRUM

In my conversations with hardware executives at PC Expo, the subject of PDAs (personal digital assistants) kept coming up. Vendors are worried that they will be either too early or too late in introducing such devices. A key question is whether these devices (whatever you think they are) are consumer products or business products.

What do you think? Are your users waiting breathlessly for PDAs? Are PDAs going to do to PCs in the '90s what PCs did to minicomputers in the '80s? Should *InfoWorld* report aggressively (as we did with General Magic's Magic Cap in the June 28 issue) on these machines? Give me a blast over E-mail or fax, please.

## The computer industry seems to be befuddled.

## NEWS

Green PCs save energy, but at a premium price.....26

Conner sets an example as the first vendor to move a hierarchical storage management system to PC LANs.....7

Apple's OpenDoc will be ported to Windows, allowing users to work on documents simultaneously.....8

IBM architectures will tie mainframes into Apple's OpenDoc.....8

NetWare for Macintosh NLM upgraded for NetWare 4.0.....79

**SOFTWARE**  
RBase for DOS gets a boost with better SQL compatibility, data integrity.....13

Two client/server human resource programs ease management.....13

Microsoft's Publisher earns kudos from business users.....16

Smart 3D projects physical attributes such as mass and bounce onto on-screen objects.....16

File Magic management software now supports hundreds of file types.....20

Hospital bedside clipcharts are being replaced with Microsoft Excel-based spreadsheets.....20

SQL/Workbench injects client/server apps with a dose of adrenalin.....22

## HARDWARE

U.S. tariff on active matrix displays is repealed, but it may not be enough to lure manufacturers back.....24

VESA will introduce a specification that offers green PC users interoperability between systems and monitors.....24

Logitech unveils the first bladeless hand-held scanner.....29

Radius' VideoVision Studio provides full-screen video for Macs.....29

Samtron's 15-inch screens let users display entire pages.....32

SmartArray reduces service and support needed by WANs.....36

## NETWORKING

Lotus Notes upgrade lets users share files across multiple LANs.....37

Cabletron's stackable hubs now support bridging and routing capabilities.....37

Three firms are introducing upgrades to asset management packages.....38

Chipcom modules will let managers segment Ethernet traffic.....38

IBM debuts 20 low-cost LAN products to attract mixed-media users.....40

NoStop Network duplicates LANtastic data to safeguard files.....40

## ENTERPRISE COMPUTING

Wide area networking poses a myriad of confusing connectivity options for LAN administrators.....48

## MANAGEMENT

Project management software alleviates the pressure on managers who are undertaking re-engineering projects.....51

MicroMan II helps a jewelry maker get application development on track.....54

Kaipana EtherSwitch serves Down to the Wire a buffet of corrupt data.....55

## REVIEWS

## PRODUCT ANALYSIS

We test the mettle of Pentium systems by comparing two desktops and two servers.....58

## REVIEWS

ALR Evolution TV 486DX PC.....65

LCD projection panels.....66

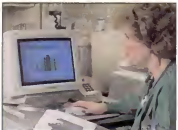
## TEST DRIVES

CA-Cricket Draw III 2.0 illustration software.....80

Quadbase-SQL for Windows 2.0 SQL access tool.....81

Expert Ease Excel add-in.....81

Microsoft Mouse 2.0 pointing device.....81



Excel replaces hospital clipcharts.....20

## COLUMNS

Window Manager / Brian Livingston.....22

LAN Talk / Paul Merzenbloom.....40

To the Editor.....42

From the Editor / Ed Foster.....43

Peer to Peer / Sally Atkins.....43

From the Ether / Bob Metcalfe.....44

How to contact InfoWorld.....44

Help Desk / Brett Glass.....45

Civilized Computing / Cheryl Currid.....56

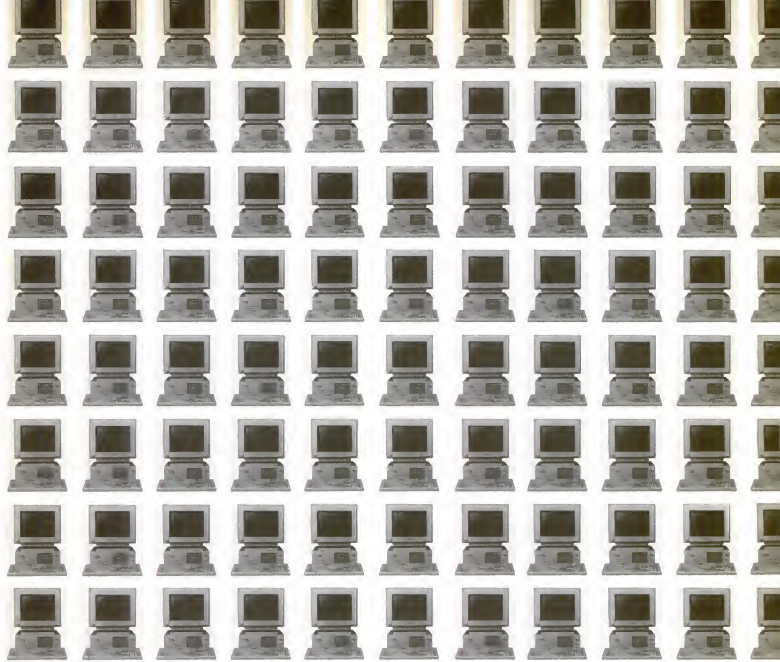
The Network Curmudgeon / David Strom.....56

First Look / Kevin Strehlo.....80

One on One / Willie Tejeda.....82

Notes From the Field / Robert X. Cringely.....82





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NSST-71U-HS33

# 'Green' desktop systems will carry a price premium

BY STEVE POULI

An energy-efficient PC isn't supposed to carry a premium price, but for at least the next year, the "green" desktop systems will fetch as much as 30 percent more than traditional desktop computers.

Federal guidelines issued in response to concerns over the growing power consumption by PCs ask manufacturers to keep prices in line with mainstream prices, but an Environmental Protection Agency (EPA) official and others acknowledged last week that some vendors have yet to comply.

The premium paid for energy-efficient PCs comes as no surprise to users, many of whom are saying the current prices make it difficult to justify buying those systems, even with the electrical savings.

"It's tough to quantify how much power you're using on your old systems, and that makes it hard to cost-justify [green PCs] to management," said Peter Hoey, assistant vice president for information systems at First National Bank of Long Island, in Glen Head, N.Y.

The EPA expects competition to eventually drive down prices. "Right now, there is something of a premium on energy-efficient PCs, though it's not as much as some users might think," said Brian Johnson, manager of the EPA's Energy Star program. "If vendors try to charge 10 to 30 percent more, nobody will buy into this, and any premium won't last more than a year or so."

Asked at last week's PC Expo show in New York which of the recently announced green PCs were priced least attractively, several corporate PC buyers pointed to the IBM PS/2 E, a 486-based desktop system starting at \$2,200.

"It's an elegantly engineered system,

with the four PCMCIA slots and higher graphics, but it costs way too much," said Saleem Nouri, PC coordinator at a large Texas-based petroleum company. "I can't see anyone buying it."

The PS/2 E, which can cost as much as \$5,800 with a 14-inch color active matrix flat screen, is priced much closer to prevailing levels, countered Rick Doepper,

IBM brand manager for the system.

"We might be a little more expensive [than comparable systems] on CRT models, but we're competitive when you consider the power savings involved," Doepper said.

"I would expect [vendors] to be charging more at this time," said Richard Bogan, manager of automation systems at

Ventronix, a New York engineering services firm. "Maybe 10 percent more is reasonable given the expected power savings."

The EPA estimated a traditional system uses \$110 of electricity per year, with basic Energy Star systems using \$60, and forthcoming highly efficient systems using just \$30 worth of power a year.

Hewlett-Packard's managed 10Base-T hubs will meet all of your expectations.

Except two.

## Corrections

In the story "Peachtree cases accounting with quick edits," June 7, page 26, the story should have read that Peachtree backs its products with 30 days of free support. After that there are several support options including PeachCare, which provides 75 minutes of toll-free support for \$99.

In the article "Tool converts Open Look apps to Motif," June 14, page 23, Integrated Computer Solutions' phone number is incorrect. The company can be reached at (617) 621-0060.

In our presentation graphics comparison (June 21, page 74), we inadvertently switched the version numbers of PowerPoint and Persuasion in "The Scores" graphic. PowerPoint is at Version 3.0 and Persuasion is at Version 2.1.

In the June 28 special report, "NT's lofty goals force Microsoft to reach out" page 1, the name of the company of which Bill Cornfield is president should have read The Windows Support Group.

The phone number in the June 28 article on Storage Dimensions Inc., page 38, was for the company's fax machine. The correct number is (408) 954-4710.

In the June 28 issue, the art for Compaq Microelectronics Inc.'s Mitac 4021 i/CT notebook (page 38) and Acer America Corp.'s AcerNote notebooks (page 40) was inadvertently swapped. InfoWorld apologizes for these errors.

U.S. list price for HP EtherTeam Hub Plus/48: HP managed 10-port hub \$1,895. Based on U.S. list prices of \$1,093: HP EtherTeam Hub Plus/48; RyoOptics 2813-04 and 2802; 3Com 3C940B 1P; Corvair M91.2. \*Customer must return warranty registration card to HP. Power supply and fan covered by five year on-site warranty only. ©1993 Hewlett-Packard Company.

# Hierarchical data storage migrates to PC LAN environment

BY TORSTEN BUSSE

Conner Storage Systems Group rolled out last week a network data storage management system that automatically migrates unused data off file servers to less expensive storage media where it remains accessible to users.

Modeled after host-based storage systems, Conner's Hierarchical Storage

Management System (HSM) software lets IS managers set up rules for storing data according to how frequently it is used. Any file that hasn't been used within a user-defined time period, 30 days for example, will be automatically moved off the file server disk to optical and tape libraries.

Users can set up a third level for data that is used even less frequently.

According to Conner officials, the process is completely transparent to end-users. File headers moved off the server still appear in the directories, regardless of where they are stored, said Tom Pisllo, product line manager at Conner.

"There is only a proportional delay in moving the file back from tape or optical storage to the server," he said.

Industry analysts said that while hierar-

chical storage methods have long been used in the mainframe environment, Conner is the first vendor to move the concept to the PC LAN environment.

"The average cost for managing 1 gigabyte of data on a PC LAN is \$14,000," said Dennis Casey, research analyst at Peripheral Strategies Inc., a market research firm in Santa Barbara, Calif. "Conner's HSM will offset that number significantly," Casey said, as it reduces the amount of time needed for manual management of network data.

An early user of HSM said the system saves money, is easy to use, and can improve an IS department's standing with its users.

"A lot of our users are elected officials and very sensitive to how we [the IS department] impact their work," said Sue Stanley, technical service manager for

- Standards-based. Novell certified.
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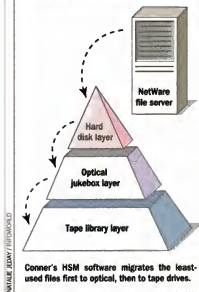
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## Conner's hierarchical storage management



Boulder County, in Boulder, Colo., which recently moved its 1,200 users off mainframes to seven NetWare servers. "With HSM we don't have to restrict their use of disk space anymore."

Due to be released at the end of July, HSM supports Novell Inc.'s NetWare 3.11 operating system and DOS and Windows clients. The first release requires a 4.4KB terminate-and-stay-resident (TSR) agent on each workstation. The next release, due in the fourth quarter of 1994, will eliminate the TSR and offer support for support NetWare 4.0 and Macintosh, Unix, Windows NT, and OS/2 clients.

Pricing for the HSM software, which supports two file servers, starts at \$7,500.

The system supports 4mm and 8mm Digital Audio Tape loader systems and optical jukeboxes, such as Conner's new Optical Jukebox Model 16L-MO, which provides up to 20 gigabytes of storage capacity. The \$19,995 jukebox, which is shipping now, features 16 disk cartridges and offers an average file recall time of 8 seconds.

Conner Storage Systems Group, in Lake Mary, Fla., is at (800) 821-8782.



## Voices From PC Expo

## What are the hot issues facing corporate IS managers today?



"We need cross-platform productivity tools. Give me a tool that supports Unix, Windows, and OS/2. ... We have a LAN system and a number of small databases we need to pull together on the desktop."

**David Chan**  
Director, technology standards  
The Equitable



"According to InfoCorp, the market for DOS applications is still strong. 'The reality is a lot of people are trying to get a job done now and they need to look at applications and the interfaces they support.'"

**Christopher LeTocq**  
Senior Analyst  
InfoCorp



"We're looking for Windows products with interoperability among different applications. ... One of our mission-critical applications is mail."

**John O'Callahan**  
Assistant Bureau Chief  
Controller's Office  
New York City

PHOTOS BY PETER SEGLING / REPORTING BY KELLEY DAMORE

## Object system to aid corporate downsizing

BY ED SCANNELL  
AND VANCE MCCARTHY

NEW YORK — Corporate developers with IBM mainframes next year can stitch together desktop and host-based applications to create seamless downsizing solutions.

IBM announced last week that its new software architecture — Systems Object Model (SOM) and Distributed Systems Object Model (DSOM) — will be at the core of Apple Computer Inc.'s OpenDoc compound document technology. (See related story, this page.)

The SOM and DSOM technologies will give OpenDoc

users the ability to develop, document, and manage a variety of object-based applications — or pieces of object-based applications — that can be sent across networks to multiple platforms.

By encapsulating various host-based services and products with SOM and DSOM, users can tightly weave popular desktop applications with host-based products and services.

"Host-based services wrapped in SOM allow developers to move pieces to the desktop," said Cliff Reeves, who is program manager of IBM's object technology products. "Once on the desktop, developers can distribute [services] throughout a

corporation."

Code based on SOM can be reused by other developers, which saves time and money.

IBM and alliance members plan to sell SOM and DSOM as vital components to corporations seeking efficient and cost-effective ways to downsize.

"This makes the whole distributed computing world become more usable in a unified way from the desktop," said Jed Harris, Apple software architect.

IBM will release versions of SOM and DSOM for its mainframe systems in the second half of this year, with versions for the AS/400 coming in mid-1994.

## WordPerfect and Novell plan to adopt OpenDoc

### Apple architecture lets users read, edit documents across platforms

BY JEANETTE BORZO  
AND TOM QUINLAN

NEW YORK — Apple Computer Inc. announced last week at PC Expo that WordPerfect Corp. and Novell Inc. will license its OpenDoc compound document architecture, formerly known as Amber, and port the architecture to the Windows environment.

OpenDoc's cross-platform capabilities will allow users to access the core functions of various applications — including Object Linking and Embedding 2.0-enabled applications — in one document and send that document across a network.

OpenDoc will let users add and edit any kind of media into documents and offer document management capabilities.

OpenDoc users will be able to create "live" documents that can be read and edited by other users even if they do not have all the programs on the desktop.

"It should be easier for users to share documents," said Karl May, Apple development tools marketing manager. "If the person they're sharing the document with doesn't have the same applications, it's still a usable document."

The OpenDoc set of application programming interfaces (APIs) for Macintosh and Windows will ship in the first half of 1994.

OpenDoc's underlying linking technology for Windows and Macintosh will be IBM's Sys-

tems Object Model (SOM) and Distributed SOM technology, which identifies parts of applications as objects and distributes them over the network to be read live by several users. (See related story, this page.)

In addition to licensing the OpenDoc API from Apple, Novell and WordPerfect will license the SOM and DSOM technology from IBM. Borland International Inc. also announced support for OpenDoc.

Novell said it will also develop OpenDoc for Unix, and IBM plans to develop an OS/2 version; neither gave a release date. WordPerfect may develop OpenDoc for DOS and Windows NT, said Mark Ericson, WordPerfect's object technology manager. In addition, OpenDoc may mean more modular packaging of software functions and more business for consultants who develop custom software.

If users can access functions in their word processor or graphics package across desktops and networks, they will no longer have to buy a publishing package that has robust text-editing or graphics functionality.

The vendors supporting OpenDoc — Apple, WordPerfect, Novell, IBM, and Borland — will form a group to certify software as OpenDoc compliant and deliver OpenDoc to ISVs as a set of APIs in C or C++.

Individual software packages could support OpenDoc in minor reconfiguration and major program restructuring.

## Compaq, Everex to bundle OS/2 with systems; PC-DOS 6.1 debuts

BY ED SCANNELL

NEW YORK — IBM's OS/2 got a big boost last week when longtime archrival Compaq Computer Corp. agreed to distribute the operating system with most of its desktop and server systems.

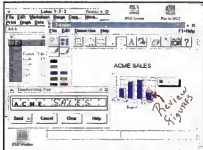
**Kevin Strehlo's First Look at PC-DOS 6.1. ... See page 80**

Under the agreement, announced at PC Expo, Compaq will offer the IBM personal software products division's OS/2 2.1 mainly to its largest corporate accounts beginning some

time in the third quarter. The deal also calls for Compaq, along with IBM, to provide users with technical support for the operating system.

Compaq officials say a significant number of their customers have shown interest in OS/2 for client/server applications in recent months.

"We have always said that if IBM could treat us like they treat [their own] PC Co., we would be interested in this sort of deal," said John Paul, Compaq vice president of marketing. "I believe [the personal software products division] will."



Pen for OS/2, also announced at PC Expo, supports handwriting recognition.

Everex Systems Inc. also signed a deal last week to supply shrink-wrapped copies of OS/2 2.1 with its Step VL Bus sys-

tems, as did Unisys Corp. with its PW Advantage and Advantage Plus.

IBM has shipped 200,000 copies of OS/2 2.1 through its distribution channels in the first three weeks of availability, according to Lee Reiswig, the division's president.

Separately, the personal software products division formally debuted PC-DOS 6.1, saying it will be available by July 26. The upgrade will be \$59 for the first 90 days through the division's 800 number. The product will cost \$189. The new operating system will be available before that date

preloaded on PCs made by the IBM PC Co. as well as on those made by several other manufacturers, Reiswig said.

He declined, however, to identify which or how many OEMs will bundle PC-DOS 6.1.

The company will release a follow-up to PC-DOS 6.1 within two months that will have a version of Addsoft Inc.'s SuperStor/DS compression utility.

Users who buy Version 6.1 before the follow-up is delivered get the compression utility free.

IBM also debuted Pen for OS/2 for pen systems. It supports handwriting recognition, even for non-pen-aware applications. Pen for OS/2 is available now for \$89.

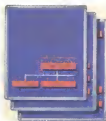
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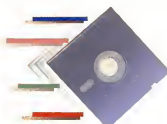
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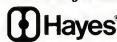
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For more information on the communications software that *Windows User* called "absolutely brilliant," phone 1-800-93-HAYES. In Canada, call 1-800-665-1259. Make it easy. Make it fast. Make it Smartcom for Windows.



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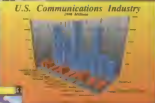
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## NEWS / SOFTWARE

## RBase for DOS gets more robust SQL

Version 4.5 also speeds complex queries, has better data integrity

## APPEAL

## SHIPPING

## Graphic spreadsheet cases cell approach

DS Lab from DS Group Inc. frees users from the "cell" approach of traditional spreadsheets by providing a graphical, manipulated flowchart-type representation of spreadsheet logic and data. The company said the product is designed to supplement spreadsheets. DS Lab can operate as a stand-alone product, or it can be used as a front-end design tool for traditional Windows-based spreadsheets. Its introductory price is \$195. DS Lab Pro, for users who need to develop, simulate, and demonstrate large models, is offered for an introductory price of \$995. (800) 828-8760.

## Vertisoft Systems Inc.'s

Spacemanager 1.5, a data compilation, storage, and retrieval program, supports MS-DOS 6.0 and Windows users as much as 40 percent more disk space over files already compressed with DOS file compression. Through November 15 users can purchase Spacemanager 1.5 for \$49.95. (415) 956-5999.

The WordPerfect 6.0 Font Pack from **Bitstream Inc.** offers WordPerfect 6.0 users 50 fonts in Bitstream's Speedo format. The \$29 software is optimized for memory-constrained environments. (617) 497-6222.

DOS and Windows users who want their signature to appear as a TrueType font for applications can do so by submitting them to **Optical Enterprises Inc.** for digitizing. The LaserJet Signature Macro works with most word processors, including WordPerfect and Microsoft Word. The TrueType format for Windows costs \$95; the HP LaserJet format for DOS is \$75. (800) 767-6724.

## ANNOUNCED

## Risk analysis adds sensitivity charts

Crystal Ball 3.0 from Decisioneering Inc. will be available July 15 for \$295. The Windows risk analysis package now includes sensitivity charts, improved performance, and more analytical capabilities. An add-in for Microsoft Corp.'s Excel works by allowing users to apply either a range of values or a probability distribution to each cell that contains an uncertain number. The package generates random values for each cell according to the allowable range or distribution. Registered users can upgrade for \$99. (303) 292-2291.

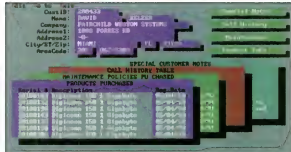
Continued on page 20

A new indexing system and an improved query optimizer give Microrim Inc.'s RBase 4.5 souped-up performance, according to company officials. The DOS-based database management system upgrade includes a higher level of SQL compatibility.

The relational database provides improved data integrity, forms, browse functions, and multiter operations. Indexing additions include full-data indexes, multicolumn indexes, index-only retrieval, and like-predicate index options, which accelerate complex queries and other data tasks as much as 20 times, the company said.

RBase 4.5 also features user-definable data caching and a read-only mode to provide more efficient multiter operations.

"The speed and flexibility of RBase 4.5 compares with the best server database engines, but without the overhead," said



With RBase 4.5, users have various indexing options to view data and improved browsing functions.

beta tester Ken Hammermesh, owner of Benefit Management Systems Inc., in Denver.

"RBase's implementation of a full referential integrity, concatenated indexes, and row-and-table entry-exit procedures make for a product that is a dream come true for those in need of full SQL and engine power on the PC," Hammermesh said.

RBase has increased database security at the database-engine level by including full ANSI 89 Level 2 SQL with full referential integrity built-in. By using the primary and foreign key functions at the database design stage, RBase users can eliminate the need for unique values and verification rules; data validation is performed automatically.

New rule verification and storage techniques have improved complex forms performance by as much as 50 percent, the company said.

Another new feature of RBase 4.5 lets users load and use forms from within forms for more efficient and intuitive data entry.

Another enhancement lets users locate, move, and resize form fields using the mouse.

A aggregate functions such as sum, count, minimum, and maximum have been added to the browser, allowing the user to query data with the browse/edit screen. Improved mouse support and walkable menus are also added.

Now shipping, RBase 4.5 is priced at \$795, and five-user LAN Packs are \$995. Upgrading to 4.5 costs \$195, and LAN upgrades are \$300.

Microrim, based in Bellevue, Wash., can be reached at (206) 649-9500.

## Client/server programs facilitate human resources management

BY SHAWN WILLET

Downsizing managers can now choose between two new client/server human resource programs. Integral Inc. is shipping InPower HR, and PeopleSoft Inc. is shipping an upgrade of its PeopleSoft Human Resource Management System (HRMS).

After years of designing host-based human resource software, InPower HR is Integral's first foray into the client/server world.

"We've completely rewritten the code for a client/server environment; it isn't just a port from the mainframe environment," said Jeffrey Comport, Integral vice president of strategic planning.

InPower provides management of applicant administration, benefits enrollment, compensation, payroll administration, and lets human resource managers perform inquiries, reporting, and updates to employee information.

One of the principal advantages of InPower is that users or human resource administrators can dynamically tailor aspects of the system, company officials said.

For example, a user can change the order of tasks to be

completed in a new hire workflow procedure or add new functions to that workflow.

NetWare Loadable Module versions of InPower are available starting with a Gupta SQL-Base version running on the server of IBM's RS/6000 and Hewlett-Packard Co.'s HP/UX, and on Windows clients, the company said.

**"We've completely rewritten the code for a client/server environment."**

Jeffrey Comport

By year end Microsoft SQL, Oracle Corp., and Sybase Inc. will be supported as server databases, as well as Windows NT and OS/2 as server platforms.

Complete company systems start at \$50,000, depending on the size of the site.

The upgrade to PeopleSoft's client/server human resource software is organized according

to positions, not employees.

PeopleSoft HRMS, Version 3.1 tracks data on job positions and links it with employees. This functionality was requested from organizations with fixed job positions, such as government, utilities, and insurance companies, PeopleSoft officials said.

"With this system we are able to bring new hires in with the position management plan with very few keystrokes," said Tully Gavres, a human resource consultant at TransAmerica Life Companies, in Los Angeles. "There is a tight relationship between the position and the employee data."

The added functionality, however, requires that TransAmerica reorganize its database, Gavres said.

PeopleSoft HRMS runs under Gupta SQL-Base, Microsoft SQL Server, Oracle, or Sybase databases running on Unix or Novell servers.

Only Windows clients are currently supported.

PeopleSoft HRMS starts at about \$130,000. The company can be reached in Walnut Creek, Calif., at (510) 946-9460. Integral, also in Walnut Creek, can be reached at (510) 939-3900.

## Improv update supports LANs, ties into Notes

Gaining parity with its newly released 1-2-3 counterpart, the latest version of Lotus Development Corp.'s Improv includes network support, integration with Notes, and data access capabilities.

Improv 2.1, announced last week, is network installable, allowing multiple users to share executable files.

Many corporations prefer network installation to maximize hard drive resources and control application use.

Although Improv 2.1 lacks the sophisticated workgroup capabilities of the recently shipped 1-2-3, Release 4 for Windows, Improv can link dynamically to Lotus Notes. With the product's Application Field Exchange, Improv worksheets can automatically update related Notes fields and vice versa.

Lotus is also making good on database connectivity promises by bundling five drivers from Q+E Software Inc.

Improv 2.1 will be available this month for \$495; upgrades are \$10.

Lotus, located in Cambridge, Mass., can be reached at (617) 577-8500.

— Doug Barney



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Offers more clip art, better wrap feature, easier table creation

BY JEANETTE BORZO

Windows users who are not professional designers are finding Microsoft Corp.'s Publisher 2.0 to be a good way to lay out business documents.

"It's very handy for a small business," said beta tester Craig Schwan, general manager at the Holiday Inn at Fisherman's Wharf, in San Francisco. "I use it for correspondence and advertising flyers. We do all of our menus using Publisher."

The new version of the desktop publishing software, in beta testing now and due to ship in July, offers a host of new features including support for styles, a printing troubleshooter, a table function on the toolbar, automatic text wrapping around newly shaped objects, 35 new design templates, support for TrueType, and drag-and-drop text editing.

"They have taken care of a lot of the problems with the first

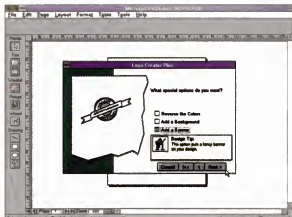
version—the like the text rotation and being able to set up tables," said Schwan, who added that the table function is easier to use than the same function in Microsoft Word.

Ease of use is a top priority in the new version, which now has cue cards to help users through tasks and a first-time help feature that users can disable once they are familiar with the software.

"I was getting ready to go to spring Comdex, and our graphic artist didn't have a brochure done," said beta tester Bill McEwen, sales director at Connect Software in Redmond, Wash. "I am in no way a graphic artist, [but] in about 15 minutes I was able to whip up a four-page brochure."

Publisher users who want to print their designs onto preformatted paper from Paper Direct can view the specialty papers on-screen for easier text and graphics formatting.

New graphics capabilities in-



**Publisher 2.0 offers a variety of new Page Wizards, including one that helps users design a logo.**

clude grouping and aligning, nudge control, and print support for posters and banners.

"The [graphics] import function works very well," Schwan said. "I do a lot of graphic input for my company like CorelDraw."

For users who do not have another graphics application, Publisher includes more than 125 clip-art images, and the WordArt applet includes new draw-

ing shapes such as starbursts, bubbles, and arrows. A new clip-art gallery lets users view thumbnails before they choose or open a graphic file.

Redmond-based Microsoft will offer the \$199 software for an introductory price of \$139 through September; current Publisher users can get a \$20 rebate off the \$99 upgrade price.

Users can call Microsoft at (206) 882-8080.

# Smart 3D gives on-screen objects physical attributes

BY CATE CORCORAN

In the not-so-distant future, users will be able to experience training programs with virtual reality running on an ordinary 32-bit PC or Macintosh.

The technology, known as Smart 3D, assigns physical behavior characteristics such as mass and bounce, to objects.

Macromedia Inc. hopes to release a developers' kit or add modules to its current programs that will let developers create real-time simulations for the desktop.

Macromedia demonstrated animations using the technology last month at Digital World, in

Beverly Hills, Calif.

Smart 3D combines a three-dimensional renderer and a 3-D object-oriented modeler. The

there is no canned animation, decision points, or branches, as in multimedia presentations and traditional 3-D graphics.

**The 3-D simulations are not scripted in advance; they are rendered in real time in response to actions from the user.**

simulations are not scripted in advance, but are rendered in real time in response to actions from the user.

With Smart 3D, authors will be able to assign physical properties, such as mass and bounce, to objects in a simulation. When

users interact with the simulation, the objects will respond to the user's original (unscripted) actions in a way that is consistent with their physical properties.

For example, the technology could be used to develop medical training programs to teach students how to perform knee surgery, said Joe Fantuzzi, Macromedia vice president of marketing.

Each piece of cartilage, bone, and muscle in the knee area would respond to mouse- or keypad-driven "surgical instruments" according to their density, mass, and other characteristics and then simulate the look and feel of a real operation.

Another possible application is training factory workers on an assembly line, Fantuzzi said.

Macromedia expects to deliver some product based on the technology within one to two years, Fantuzzi said.

No pricing has been set because the company has not decided whether it will create a stand-alone package or wrap the technology into its presentation program.

Licensing the technology to commercial and in-house developers is also an option, Fantuzzi said.

Macromedia is located in San Francisco and can be reached at (415) 252-2000.

# Engine allows DOS programs to play video

BY KELLEY DAMORE

FutureWare Inc. is providing a way for DOS developers to integrate multimedia capabilities into the applications they build.

Video for DOS, a multimedia delivery engine, supports both software-only and hardware-assisted playback of compressed video at 15 to 30 frames per second.

The software also supports MPEG, JPEG, PLV and RTV

decompression algorithms. The product includes a Multimedia Kernel (MMK) and supports AVI and AVSS file formats.

The MMK can reside on a Novell Inc. NetWare or IBM OS/2 LAN and deliver data from a local disk, the company said.

Designed and packaged as C libraries, Video for DOS is targeted at developers who want to incorporate multimedia in DOS applications or operating sys-

tems, such as Unix, that do not currently offer multimedia extensions.

This is the company's second multimedia offering. FutureWare co-developed IBM's AWE (Audio Visual Kernel) for Storyboard and Linkway Live authoring products.

Video for DOS is available immediately with prices starting at \$2,995.

FutureWare, in Princeton, N.J., can be reached at (609) 924-4269.

# Alpha revamps its relational DOS database

BY ED SCANNELL

To widen its appeal to corporate accounts, Alpha Software Inc. is offering an upgrade of its relational database that is designed to give experienced developers more flexibility.

Version 3.0 of the company's Alpha Four database features significantly improve interactive development tools so corporate programmers can create or modify applications faster and at less expense.

Improvements to the program include the capability to enter and edit data in multiple files from a single data screen, as well as the capability to program with scrolling windows that display data from linked databases.

Other new features include full mouse support, the capability to save data to use as database files during data entry, and automatic referential integrity.

Alpha had previously positioned the program for nonprogrammers, touting its relational capabilities. The company has had some measure of success, selling 45,000 copies.

But now it believes there is an equally attractive opportunity in the corporate market.

"We think Alpha Four is perfect for nonprogrammers who don't have the desire to use a database language but still need to customize applications," said Selwyn Rabins, cochairman of Alpha Software.

"With this version we are going one step further by improving the product's benefits for developers as well," Rabins said.

The historically DOS-based Alpha appears to be swimming against the Windows-based database tide of products such as Microsoft Corp.'s Access and others.

But Rabins believes that the market for DOS-based databases will more than hold its own until the necessary hardware to run Windows applications ships.

"We believe users will continue to rely on DOS databases to solve real-world problems until the hardware gets up to the 486 and 8MB level you need to run Windows databases well," Rabins said.

Users who have Version 2.0 and 2.1 of the product can transfer data over to the update transparently. Users with Versions 1.0 and 1.1 can obtain a utility that converts their data to work with Version 3.0.

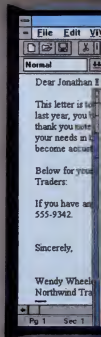
The single-user version of Alpha Four 3.0 costs \$495. The networkable version is priced at \$595, and upgrades are \$69.

Alpha Software, in Burlington, Mass., is at (617) 229-2924.



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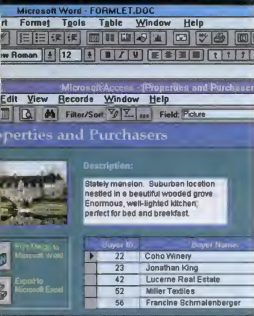
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## PIPELINE from page 13

## ANNOUNCED

**Fastback Plus for Windows, OS/2 due**

Fifth Generation Systems Inc. plans to ship this month Fastback Plus 1.1, for Windows and Fastback Plus for OS/2. The Windows version adds support for QIC tape hardware including Archive, Imagem, and the Colorado Memory Systems Jumbo Series. It also adds a customizable Fastbar that enables users to perform common backup and restore operations with one mouse click. The OS/2 version takes advantage of multitasking and scripting capabilities in OS/2 and is compatible with the company's DOS and Windows backup products. Users can choose the Fastback Plus interface or customize their own. The Windows version retails for \$149, and the OS/2 version retails for \$199. (504) 291-7221.

## SHIPPED

**Win-911 alerts for tolerance problems**

Win-911, a Windows program for alerting users of alarms or out-of-tolerance conditions, can act as a client end to any Windows application via Dynamic Data Exchange. Specter Instruments provides a library of sounds, including bells, sirens, alert horns, and whistles. Custom sounds or speech messages can easily be recorded using a microphone and standard Microsoft Windows recording utility. Applications include monitoring industrial equipment, building security, text messages for scoreboards, and unattended reporting. Win-911 is priced below \$1,000. (800) 331-8740 or (512) 326-1011.

**Extrasys Software** introduced PS Error 2.0, a replacement error system for CA-Clipper, and Sez You 2.0, an environment control utility for Clipper. New features include Clipper 5.2 compatibility and support for Funcity, ProVision, and CA-Clipper Tools III. Sez You now supports Clipper 5.2, Clipper 5.5's virtual network manager, and easier configuration. PS Error and Sez You are priced at \$149.95 each. (818) 981-8367.

**Intellink Corp.** now has software that transfers information from the Hewlett-Packard Co. OmniBook 300's Appointment Book and Phone Book applications to desktop PCs. The \$69.95 package transfers the information to several spreadsheet, database, and word processor formats, including dBase, Excel, 1-2-3, Ami Pro, Paradox, Word for Windows, and WordPerfect for Windows. It also transfers to some PC Personal Information Manager formats. (603) 888-0666.

## File management product works with more formats

By SHAWN WILLET

Westbrook Technologies Inc. updated its File Magic document management software to work with a full range of word processing and spreadsheet files with its text retrieval capabilities.

Now shipping, File Magic Plus 3.0 supports WordPerfect, Word, Excel, Lotus, and 100 other types of files.

Gray-scale and color images are supported, as well as Dynamic Data Exchange links to other software.

Users can search documents and other files into the File Magic database, where they are indexed according to 20 fields, said Michael Graham, Westbrook vice president of marketing.

Users can then search files or topics according to the indexed fields or search for the text within the files using keywords.

"If a user wants to edit the file, he has to put it back into the application, change it, and then put it back into File Mag-

ic," Graham said.

Users were impressed by the range of new features.

"If we want to put a WordPerfect file in there, we no longer have to scan in a piece of paper," said Rod Hiltheist, manager of office systems at Epson America Inc., in Torrance, Calif. Epson's customer support department is using the software to pull up relevant technical documents or sales literature for on-line support.

"With the color capabilities, we can scan in line art diagrams and understand them," Hiltheist said.

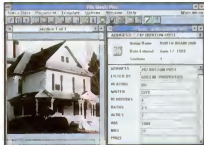
The tool also supports merge and separate, a function that allows remote users to update the home database and vice versa.

File Magic Plus comes in three versions: File Magic Plus Personal; the Professional version, which includes full-text support and full-page optical character recognition; and the Workgroup version, which also includes record locking and security to work on Novell Inc.'s NetWare.

Banyan Systems Inc.'s Vines, or Microsoft Corp.'s LAN Manager.

The Personal and Professional versions sell for \$595 and \$1,295, respectively. A 10-user Workgroup version is \$2,495.

Westbrook Technologies is based in Westbrook, Conn. and can be reached at (800) 949-3453.



Users can search files or topics by indexed fields or search for text using keywords.

## Build client/server apps to access legacy databases

By KELLEY DAMORE

Trinzic Corp. recently introduced a tool that allows users to build client/server applications to access host-based legacy databases.

InfoHub, a data management tool, consists of two components: an Open Database Connectivity (ODBC) driver that resides on the client and InfoHub server software that resides on the mainframe. The product allows PC and workstation users to access and update both relational and nonrelational databases, including IMS, Adabas DB2, VSAM, CA/IDMS and sequential files. The driver uses a common interface to process the request and forward it to the gateway.

The tool also includes an ob-

ject-oriented programming language to write stored procedures and triggers. The language automatically generates database management system (DBMS)-specific code, officials said.

By using a middleware gateway, InfoHub can read, write, and update data and join the data from multiple databases, officials said.

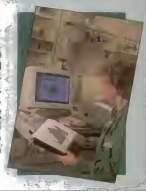
Micro Decisionware, a middleware gateway vendor, will market Trinzic's InfoHub and InfoPump as an option to its Database Gateway product line.

The product will be available in the fourth quarter with base prices ranging from \$50,000 to \$75,000.

Trinzic Corp., in Palo Alto, Calif., can be reached at (415) 328-9959.

## From a spreadsheet ... to a data processing solution

A university hospital replaced its bedside clipcharts with a spreadsheet-built application that provides doctors and nurses with graphical representations of a patient's temperature, blood pressure, and fluid levels. Using Microsoft Corp.'s Excel spreadsheet, doctors also used its calculation engine to determine drug dosages.



UNIVERSITY HOSPITAL

## Spreadsheets go beyond the office

Managers applying programmable tools to corporatewide problems

By DOUG BARNEY

With their increased programmability, spreadsheets are being used to build applications to solve corporatewide data processing problems.

Vanderbilt Medical Center, in Nashville, Tenn., built an application using Microsoft Corp.'s Excel as the main application for patient monitoring. Borland International Inc.'s Quattro Pro is used to track ownership of mineral rights.

At Vanderbilt, an Excel-based application has replaced paper flow charts that used to hang from patients' beds. Doctors view a computer screen showing graphical representations of the patient's current blood pressure, fluid level, and temperature. Because the vital signs are tracked on the graphical spreadsheet, doctors can see trends that help them spot problems and determine whether treatments are working.

The spreadsheet's calculation engine also helps doctors determine individual drug dosages and IV drip rates.

And, Excel applications are used to record the patient's status by providing an interface for generating notes.

The Excel-based electronic charting system at Vanderbilt took five years to build and has been running for 18 months.

"We didn't think a PC-based package could do everything we wanted," said Dr. Stanley Higgins, associate professor of medicine at Vanderbilt University and codeveloper of the application. "We just wanted a prototype."

In addition to making earlier

crisis intervention possible, the system helps nurses find qualified patients who fit the criteria for treatments in the many clinical trials that are run in the hospital. The hospital is archiving the data, which can be used to research the efficacy of drugs and other treatments.

In another case, The Chart House restaurant chain, in Solano Beach, Calif., uses an Excel spreadsheet to track its critical daily statistics. Using an Enterprise Information System front end, the system can alert district and area managers to the latest meal revenues, customer counts, and labor figures.

"Although we have a monthly reporting cycle, now on a daily basis we can look at key performance indicators," said John Townsend, director of information systems for the Chart House.

Borland's Quattro Pro is being used by JLB Petroleum Land Management, in Midland, Texas, to determine ownership of specific underground oil wells.

Because these mineral rights do not directly correlate to ownership of the land's surface, hundreds of people may have a claim on a particular find.

JLB uses Quattro Pro to manage this bewildering array of claims, figuring out exactly what fraction each person owns.

The trend of spreadsheets assuming more sophisticated jobs is expected to continue with added programming development features in upgrades such as Quattro Pro for Windows 5.0, shipping this summer; Excel 5, expected in the fall; and the recently shipped Lotus 1-2-3, Release 4.0 for Windows. □



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# SQL/Workbench speeds up client/server apps

By Ed Scannell

Intelligent Environments Inc. is targeting users who are hamstrung by poorly performing SQL with a development tool intended to give a performance boost to client/server applications.

SQL/Workbench, Version 2.1 implements what the company claims is the first open static SQL repository with static SQL

capabilities for tools that ordinarily require dynamic SQL.

Version 2.1 combines a language-independent architecture, multithreaded static SQL team programming, and various maintenance facilities, said Terry Goleworthy, Intelligent Environment president.

"We think this is a good choice for organizations trying to overcome the usual roadblocks of dynamic SQL and

who are looking for tools for their line-of-business/client/server applications," Goleworthy said.

The new tool's repository architecture eliminates the need to maintain embedded SQL source code that is not shared. This better enables corporate accounts to use the expertise of their database specialists, Goleworthy added.

The tool also makes it possi-

ble to share SQL definitions among several members of a team.

Version 2.1's version control features simplify the subsequent maintenance and reuse of SQL statements.

SQL/Workbench offers static SQL access plans for SAA databases such as DB2, DB2/6000, SQL/400, and DB2/2, Goleworthy said.

Better tuning features for

DB2 are included, as well as IBM's Distributed Database Connection Services/2.

The company plans to ship the package by July 15. The package will cost \$8,400 to users purchasing new licenses. Current Workbench users can upgrade free of charge.

Intelligent Environments Inc., located in Tewksbury, Mass., can be reached at (508) 640-1080.

## Product Spotlight

### Point-and-click transfers due

By the end of July Digital Instrument Technology Inc. will release software that allows users to transfer PC files to Macintosh formats and vice versa with simple point-and-click operations.

TransferPro for Windows supports any SCSI device, including Bernoully and SQuest drives, magneto-optical drives, and Data Shuttle removable hard disks.

Files transferred with the software will retain their original format, including line length and spacing.

TransferPro for Windows supports all typical file and directory operations including copying, deleting, moving, pasting, renaming, and removing.

The software is priced at \$99 for a single-user license.

The software is also available for Sun Microsystems Inc.'s Solaris 2.1 and Silicon Graphics Inc.'s Unix platforms, priced at \$349 for single users. A floating license is priced at \$549.

Digital Instrument Technology is headquartered in Los Alamos, N.M. For more information, the company can be reached at (505) 662-1459.

—Torsten Busse



## Long-awaited PackRat 5.0 shipping

### Problems with conversion utility stymied Polaris

By Jim Hammett

Polaris Software Inc. last week shipped the long-delayed release of PackRat 5.0, the company's Windows information manager.

PackRat on April 29, but because of problems we found in the conversion utility we held the release until that feature could be fixed," the company said in a statement, adding, "We just want to ship a quality product."

Several users called InfoWorld's gripe line to report continuing delays in the shipment of the product.

"It seemed that after I ordered and paid for the upgrade, I was given the runaround on when the product would ship each time I called the company," said one angry user.

"I had issue that the company has had use of my funds for almost two months and hasn't shipped a product," another user said.

Some users who complained of the delay described themselves as fans of the product but were disappointed that the company didn't offer better estimates of when the product would finally ship.

One user said the company should not have taken customers' money until after it shipped the product.

"We tried to offer customers our best estimate of when we felt the problems we encountered with the conversion utility could be fixed," a company representative said.

It appeared user frustration over the product's delay, Polaris released an upgrade several weeks ago through retail chan-

nels that did not include the conversion utility, the company said.

Polaris said it would work overtime to fill orders for the product.

"We will be working 24 hours a day, seven days a week because of the demand," the representative said, adding that the company will use some outside sources to help it get the final full release of PackRat 5.0 to users who ordered through the company.

"The \$8 shipping charge will be used to send the upgrade by overnight delivery," the representative said.

For customers who canceled their orders and originally paid with American Express, Visa, or MasterCard, Polaris said it would take a few days for the refund to appear on customer statements.

Window Manager / Brian Livingston

## There's an undocumented shortcut to defragmenting a drive



It is, by now, well known that Windows requires contiguous free space on a hard disk drive to create a permanent swap file. You create this contiguous space by running a file defragmentation utility, which moves all the files on a disk, leaving a single, unbroken open space on the drive. In this open space you can create a permanent swap file by opening the Windows 3.1 Control Panel's 386 Enhanced dialog box, clicking the Virtual Memory button, and then clicking the Change button.

Usually I don't recommend that you rely on a permanent swap file. I would prefer that you install enough RAM in your system that Windows never needs to swap anything to disk.

(You can tell whether Windows has swapped anything to disk by opening all your applications in Windows. Then press Alt+Esc to switch to each application in turn, and watch your disk drive light. If the light goes on when you switch to an application, it means that Windows

had swapped that application to disk and that you should get more RAM.)

But there are cases in which only a permanent swap file will help you. Usually there is no good for creating a permanent swap file. But DEFRAG is notably slow.

Imagine that you have been given the task of adding permanent swap files to, say, 100 PCs in your company. Waiting for DOS 6.0's DEFRAG to give you contiguous space on all these PCs could take days.

But not if you know the undocumented switch that speeds up DEFRAG. Run the command DEFRAG /Q at a plain DOS prompt (with Windows not running).

The /Q switch stands for Quick. When you run DEFRAG /Q, the utility does not bother to move each file's clusters into consecutive order. Instead, it simply moves all the disk clusters so that they reside at the beginning of the drive, leaving one contiguous space on the disk — perfect for creating a permanent swap file.

After making your swap file (a process that takes only a few seconds in Windows), you may want to defragment all the files completely, because this does

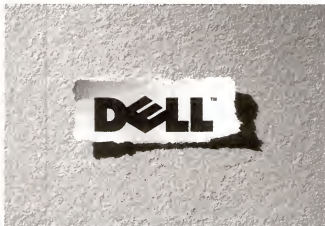
give the user somewhat faster disk access. In that case, start a full defragment with the command DEFRAG /F after exiting Windows. Now you can tell the user that he or she can start using the PC again after the DEFRAG screen has ended — and you can go on to the next PC.

The /Q switch is not mentioned in the Microsoft MS-DOS 6.0 Technical Reference, nor in the on-line text that appears when you type HELP DEFRAG. Two managers at Microsoft told me that the company had been having discussions with Symantec (which provided the DEFRAG code) about which features would and would not be provided for the money that Microsoft was paying. The Quick feature was left out of the documentation but actually did make it into the product.

I would like to thank reader Pete Paciorek, who asked what the /Q in DEFRAG did.

Brian Livingston is the author of Windows 3.1 Secrets and Windows Gizmos (IDG Books). Send tips to 70053.2036@compuserve.com; or fax: (206) 282-1248.

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# CLONE.



## IBM PC Co. follows Dell's lead with new support options

By Neal Boudetta

Two months after Dell Computer Corp. introduced a menu of user-support options, IBM Personal Computer Co. has followed suit.

IBM's new Customer Center.

Reprinted from April 1990 issue of PC Week, ©1990 2th Communications Company

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## NEWS / HARDWARE

## PIPELINE

## ANNOUNCED

**Genicom 330-cps dot-matrix printer previews**

Genicom Corp. introduced a semi-dot-matrix printer at this week's PC Expo. The printer features 330-character-per-second speeds and supports rear, front, bottom, and manual cut sheet paper paths. The Model 1220 offers ANSI, IBM Proprinter XL24, and Epson LQ-1050 emulation. Priced at \$1,495, the printer will be available in the third quarter. (800) 443-6426.

**Pacific Rim Data Sciences** announced a hardware/software package that allows a Hewlett-Packard Co. 4L laser printer to output PostScript images and convert fax streams to 300-dot-per-inch plain-paper faxes. The \$495 Pegasus Universal FM external SCSI-to-Contronics/RS422 protocol converter transmits data at 200Kb per second. (510) 228-8930.

**Itocuh Technology Inc.**, formerly of **Stash Technology**, introduced a thermal transfer printer. The Pictography 3000 offers 256 density levels and can print up to 16.7 million dots. Its resolution is 400 dots per inch, and it can generate a print in less than 2 minutes, officials said. The printer is available now for \$23,000. (800) 347-2484.

**Verbox Voice Systems Inc.** introduced continuous-speech interfaces for popular applications including Microsoft Office, WordPerfect, and PageMaker. Asymetrix Compel, CoreDraw, and AutoCAD for Windows. The application interfaces provide command, control, navigation, and data entry by speaking in words, phrases, or complete sentences. The Speech Value Packs will be available in August for \$99.95. (800) 275-8729.

## PRICE CUTS

**Creative Labs cuts**

**VideoSpigot's price** Creative Labs Inc. last week cut the price of its video-capture card, the VideoSpigot, from \$499 to \$399. The company also announced it will add the Cinepak video compression and decompression algorithm from SugiSoft and a copy of Video for Windows to the card. The new version of the card will ship this month. Depending on the speed of the user's bus, the card will capture and compress video directly to the hard disk at about 30 frames per second in a video measuring 160 by 120 pixels. (408) 428-6600.



Users may get cheaper repairs on notebooks like this Toshiba 74600C now that the tariff on active matrix screens is lifted.

## Repeal of active matrix display tariff is too late

Manufacturers who moved out of the country aren't likely to return

BY YVONNE L. LEE

The U.S. Department of Commerce's repeal of the tariff on active matrix displays last month may have come too late to affect vendors and consumers of notebooks using those displays.

The nearly 63 percent anti-dumping duty levied in 1991 made notebook manufacturers flee like children at chore time. Because the duty affected only the displays, not the finished products, companies moved their manufacturing plants for notebooks using these displays to foreign shores.

Computer companies argued against the tariff, saying there was no U.S. active matrix display industry and the levy would damage their industry.

Consumers may benefit from slightly lower costs and faster delivery times if the notebook manufacturers build active matrix models domestically, some companies said. However, two years after taking flight, manufacturers may not return their plants to the United States even with the repeal.

"I think the damage is already done," said Andrew Seybold, editor of *Outlook on Mobile Computing*. "How many times can you move a factory?"

Seybold estimated that the tariff, aimed at preserving U.S. jobs, may have saved 300 jobs while losing 10 times as many. Lifting the tariff may only regain about 100 because so few

plants will relocate, he said.

Of the major notebook manufacturers, only Apple Computer Inc. said it plans to move some production to the United States. Toshiba America Inc. and IBM said they are still evaluating whether to manufacture some active matrix notebooks here.

Toshiba makes most of its notebooks sold in the U.S. at its plant in Irvine, Calif., and will probably make some active matrix models there now, said Bob Wittenberg, manager of corporate communications.

Even when companies elect not to move manufacturing to the United States, American customers may reap some benefit from the lifted tariff. Users of active matrix notebooks may have lower repair costs now that the companies will not have to pay the tariff on the replacement parts, said Yvonne Donaldson, a Compaq Computer Corp. representative.

Compaq will continue making its current line of products in Singapore but will consider making future products in Houston, she said.

The government's motivation for lifting the tariff may have had nothing to do with U.S. jobs, or repair costs, however.

"They are probably preparing for negotiations with Japan over trade barriers and wanted to get rid of the ones that are obviously bogus on the U.S. side," said Jack Roberts, principal analyst for graphics and displays at Dataquest, in San Jose, Calif.

## VESA bridges gap in green products

Systems, monitors can't be mixed

BY GATE CORCORAN

**NEW YORK**—It seems there is a slight problem with "green" PCs: Users can't mix and match monitors and systems from different vendors. A particular monitor's power-saving features will work only if used on the machine with which it is sold.

The Video Electronics Standards Association (VESA) announced last week at PC Expo that it plans to fix that problem with a specification that will allow different manufacturers' Energy Star systems and monitors to interoperate.

The VESA Display Power Management Signaling specification will be finalized in late July, with products shipping around September, a VESA representative said.

However, some manufacturers are already shipping products that comply with the specification, which is not likely to change, and await only an official stamp of approval from VESA members.

For example, IBM's recently

announced PS/2 E system already complies with the specification, an IBM representative said. So does a monitor from Samtron Displays Inc. announced here last week at PC Expo. (See story, page 32.)

Both companies said future Energy Star products will comply with the VESA specification.



IBM in particular plans to come out with a whole line of Energy Star, VESA-compliant

monitors—possibly this month, sources said. Users can also expect to see compliant products from Intel Corp., Sony Corp., Phillips, and NEC Technologies Inc., among others. These companies sit on the VESA committee and have said they will support the specification, according to San Jose, Calif.-based VESA.

The specification tells manufacturers how to design their products that use the same electronic signaling scheme between monitor and system.

## Apple offers 4½-pound portable ink-jet printer for the PowerBook

BY KELLEY DAMORE

Apple Computer Inc. last week introduced a portable ink-jet printer for PowerBook users.

The Portable StyleWriter is a 4½-pound printer that offers 360-dot-per-inch resolution.

The printer comes standard with 39 TrueType fonts and measures 1.9 inches by 12.2 inches. It can print on envelopes, labels, transparencies, and letterhead, officials said.

"The Portable StyleWriter can go anywhere a PowerBook user goes, providing a convenient, easy-to-use solution on the road or on the desktop, at home or in the office," said Fred Forst, senior vice president and general manager of the Macintosh systems division.

"Currently, about 20 percent of laptop users are purchasing portable printers," said Marco Boer, senior analyst for Interna-

tional Data Corp., based in Framingham, Mass.

"Apple is not looking to move a lot of volume with the [Portable StyleWriter], but rather provide a solution to its PowerBook users," Boer added.

The Portable StyleWriter comes with a rechargeable nickel-



The Portable StyleWriter offers 360-dpi resolution and comes with 39 TrueType fonts.

cadmium battery and an AC adapter. Users can print 55 pages between charges. The printer is priced at \$439. An optional automatic sheet feeder costs \$79.95.

Both printers are available immediately through resellers. In Apple, in Cupertino, Calif., is at (408) 996-1010.



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## Procom stacks four CD-ROMs in tower case

BY KELLEY DAMORE

Procom Technology Inc. this week introduced a CD-ROM tower, allowing business users to access CD-ROM applications on a network.

The CD Tower-4-DS consists of four double-speed CD-ROM drives in a tower enclosure. The device ships with drivers for Novell Inc.'s NetWare 3.11 and 4.0, as well as drivers for DOS and Windows.

Users can simultaneously access data stored in any of the four drives. This is particularly useful for library archiving and document imaging applications, officials said.

The CD-ROM mechanism offers a data transfer rate of 330KB per second and a 200-millisecond average access time. The double-speed drives have a synchronous transfer rate of 4.2MB per second, officials said.

The drives offer a 256KB em-

## Users can simultaneously access data stored in any of the four drives.

bedded cache, a 50,000-hour mean time between failures, and a dust-proof CD-access door.

The tower is MPC compliant. The CD Tower-4-DS can also read X/A (extended audio) discs and supports Kodak's Photo-CD multiresolution format.

It can be used with any host adapter that supports the ASPI standard. In the future, the tower will support Windows NT, SCO Unix, and OS/2, company officials said.

Priced at \$2,795, the CD-ROM tower is available immediately through resellers, dealers, and distributors.

Procom, in Irvine, Calif., can be reached at (714) 852-1000.

# Logitech scanner doesn't need board

Hand-held device connects to parallel port — a boon for laptop users

BY KELLEY DAMORE

NEW YORK — Logitech Inc. unveiled the first boardless, hand-held scanner last week at PC Expo.

Most scanners require an interface card to connect to a PC. However, Logitech's ScanMan Easy Touch plugs into the parallel port interface, making scanning available to laptop users and those who do not want to open their machines.

The Windows-based scanner

is a gray-scale device that can scan up to 256 levels of gray. It offers four resolution modes: 100, 200, 300, and 400 dots per inch (dpi).

Although using a parallel port provides slower transmission, the speed difference will only be seen when scanning images in 300- and 400-dpi resolutions, according to Molly Carlson, product manager for ScanMan.

The scanner comes bundled with FotoTouch, Version 1.2 color image editing software.

FotoTouch is a TWIN-compliant program that automatically merges multiple strips of an image. The software also has a basic set of editing tools and the capability to open multiple images on-screen and cut and paste among the images.

The scanner also comes bundled with the OmniPage Direct AnyFont optical character recognition package, which was codeveloped by Caere Corp. and Logitech. This package will come bundled with all Windows

hand-held scanners, according to Carlson.

System requirements include an IBM-compatible AT with a 386SX processor or higher, 4MB of RAM, 5MB of free disk space, DOS 3.1 or later, Windows 3.1, and a VGA graphics card.

The \$399 device will ship in August through dealers and distributors.

Logitech of Fremont, Calif., can be reached at (800) 231-7717.

## Mac gains full-screen video with Radius card

VideoVision Studio rivals more expensive professional equipment

BY CATE CORCORAN

BEVERLY HILLS, Calif. — For Macintosh users who want the ultimate video board, Radius Inc. last week started shipping VideoVision Studio.

At \$4,499, VideoVision Studio probably will appeal most to professional users. According to Radius, the board and its bundled software provide a complete editing and production system suitable to replace professional equipment costing tens of thousands of dollars.

VideoVision Studio can capture and compress QuickTime files. The files can be played back at full screen — 460 by 480 pixels — at full motion or 30 frames a second, a feat still rare among video boards.

In addition, the board can display 24-bit color at the same time and compress in real time before sending video to the disk, saving space on the hard disk. It also has internal and external audio mixing capabilities.

SuperMac Technology offers a similar board that sells for about the same price. According to Radius, the VideoVision Studio

is superior because it can display video at 60 fields per second. The SuperMac board shows only 30 fields per second, according to Radius. Fields refers to the interlaced lines on a television screen. A television displays 60 fields per second, said Chuck Berger, Radius president and CEO.

The board ships with the Adobe Premiere editing package and VideoFusion special effects program.

The total system supports A/B roll editing, extensive special effects, and SMPTE time coding, which allows accurate audio-visual synchronization, Radius said.

Users can output finished video to hard disk, videotape, and other formats. In the future, users will be able to upgrade the board by adding modules to the board's H-bus, according to Radius.

Owners of Radius' previous VideoVision board can upgrade to VideoVision Studio with a module for \$1,999.

Radius is located in San Jose, Calif., and can be reached at (408) 434-1010.

## Samsung offers low-cost 486 desktops, notebook

BY TOM QUINLAN

A line of low-cost 486-based systems is being introduced by the information systems division of Samsung Electronics America.

The ValuePlus+ line features three desktop systems and a notebook.

Two of the desktop systems feature Intel Corp.'s 33-MHz 486 and 486DX2/66 processors. Both come equipped with two VESA local bus slots, as well as five standard ISA slots.

A 14-inch color monitor,

DOS 6.0 and Windows 3.1, and a mouse also come standard with both systems.

The 33-MHz 486-based SD933V also comes with 4MB of RAM and a 120MB hard drive. It is priced at \$1,699.

At the higher end, Samsung is adding 8MB of RAM and a 250MB hard drive to its SD966V system. List price for that system is \$2,199.

Samsung is rounding out its ValuePlus+ desktop line with a \$1,099 model based on Cyrix Corp.'s 25-MHz 486SLC chip.

The SD760V comes with 2MB of RAM, a 120MB hard drive, monitor, Windows 3.1, and DOS 5.0.

The notebook line is also based on Cyrix's 25-MHz 486SLC processor and features 2MB of RAM, a 120MB hard drive, and a 10-inch gray-scale LCD display.

The \$3,800V notebook has a list price of \$1,499.

Samsung, in Ridgefield, N.J., is at (800) 543-8193.



Samsung's \$1,699 33-MHz 486 ValuePlus+ has 4MB of RAM and a 120MB hard drive.

## Zenith to use clock-doubling 486DX2 in its 'build-to-order' Z-400+ line

BY TOM QUINLAN

NEW YORK — Zenith Data Systems has expanded its "build-to-order" Z-400+ line to incorporate Intel Corp.'s clock-doubling 486DX2/50 and 486DX2/66 processors, along with local bus graphics.

The ZDS systems, announced here at PC Expo last week, will

also be capable of using the company's new 256KB write-back cache module, which can better support the need to get data into the clock-doubling processors as quickly as possible.

One configuration of the new Z450+ system will include a 486DX2/50 processor, 4MB of



RAM, a 14-inch monochrome monitor, and a 170MB hard drive for a list price of \$2,099.

The cache is a standard feature on the new 450+ and 466+ machines. It can also be added as a \$239 option for existing DX-based systems.

As part of ZDS' configurable line, users can custom-order sys-

tems with a wide range of 486 processors, six different monitors, and hard drives ranging from 170MB to 510MB in size.

ZDS also demonstrated at the show its pen-based Z-Note notebook with the Z-NotePad, which uses 486SLC-based design includes 4MB of RAM, a 120MB hard drive, a pen-capable monochrome display, and

built-in Ethernet connections.

The system uses Microsoft Corp.'s Pen Windows operating system and has a list price of \$2,999.

Existing Z-Note users can upgrade their systems to a Z-NotePad for \$1,999.

ZDS, in Buffalo Grove, Ill., can be reached at (800) 553-0331.

# Why PowerBook is popular with people who use Macintosh.

**Flexible choices.** Five all-in-one models with built-in floppy drives provide a range of choices for screens (color, black-and-white or gray-scale) and processor speeds. Two PowerBook Duo models turn into powerful desktop systems when used with a Duo Dock.

**Colorful possibilities.** Mobile presentations are easy with a color PowerBook, or by using built-in video-out to drive up to a 16-inch color monitor.

**Quick service.** A toll-free repair hotline gives PowerBook users access to the fastest possible service, anywhere in the U.S.

**Easy data transfer.** PowerBook easily shares files with a desktop Macintosh over a network. It can also connect directly in SCSI mode, transferring files almost as quickly as an external hard disk.

**Fully expandable.** Most PowerBook models have a SCSI port that lets you connect to up to seven external devices, such as a scanner, CD-ROM drive or Ethernet interface.

As people search for new ways to boost productivity outside the office, more and more are choosing Apple® PowerBook® computers. And not just because of the familiar benefits of the Apple Macintosh® system.

Unlike other notebook computers, PowerBook is designed for the way people actually work when they are away from their desks.

Beyond the walls of the office, they need to stay



connected to their network for access to servers and e-mail, and PowerBook makes it easy. They need to make full-scale presentations, and PowerBook provides built-in support for color monitors, sound and QuickTime® software-based movies. They need to be able to send and receive faxes, and PowerBook can make that simple, too.

In fact, with its award-winning design, PowerBook

makes it easier to get any kind of work done, anywhere.

Even people who need both portability and full expandability find a solution in PowerBook. Because the PowerBook Duo® System offers the best of both worlds — a notebook computer that transforms itself into a powerful desktop computer.

Clearly, organizations using Macintosh have helped make PowerBook the nation's best-selling notebook.

But they haven't done it alone.

# Why PowerBook is popular with people who use MS-DOS and Windows.

**Easier support.** PowerBook requires less training than other notebooks. So you can spend less time helping frustrated users, and more time doing your job.

**One drive fits all.** Using software included in the optional PowerBook/DOS Companion, the built-in Apple SuperDrive floppy drive can read/write MS-DOS and OS/2 disks — so moving files between platforms is effortless.

**Higher productivity.** PowerBook makes it easy to do more, so people can get more done, using remote access, faxing and e-mail.

**MS-DOS-friendly.** The optional PowerBook/DOS Companion package gives you the necessary software and cables to work with MS-DOS files, printers and monitors you already own.

**Preserves your investments.** PowerBook is designed not just to work with existing desktop equipment, but to help you get the most out of it.

PowerBook has also become the notebook computer of choice in some rather surprising places. Not only because it's designed for the way people work outside the office, but because it works so well with computers running MS-DOS or Windows.

The optional PowerBook/DOS Companion\* lets PowerBook users access MS-DOS files from most popular business applications, connect to VGA and SVGA monitors and work with over 1,000 different printers.

So whether people find themselves working in a branch office, a client's office or their own office, it's always business as usual.

PowerBook is designed so people can easily share files with colleagues who use Macintosh or MS-DOS computers. Without a dedicated server, it can connect directly, over the office network or over the telephone lines. It also gives people a simple way to retrieve data from mainframes and minicomputers.

People experienced with Windows applaud the simplicity of PowerBook. They also appreciate a notebook that integrates essential mobile-computing features like networking, video-out and file sharing.

And they appreciate a notebook computer that finally gives them the power to get the most out of their existing investments. The kind of power that's easy to get used to. The power to be your best.

Apple 

# 15-inch monitors offer high resolution, refresh rates

BY CATE CORCORAN

Now that the 14-inch monitor has become the standard among business users, display companies are taking the next step and developing 15-inch screens for them.

Samtron Displays Inc. last week announced the SC-528MXL, which works with PCs and Macintoshes.

According to Samtron, the advantage of the slightly larger screen is that users can display an entire page of a document at once. For example, users will be able to see all of one page of any WordPerfect document, the company said.

The larger screen also allows higher resolutions — as high as 1,280 by 1,024 with a 60-hertz refresh rate. Users who want higher refresh rates for flicker-free displays can select resolutions ranging from 640 by 350 to 1,024 by 768 pixels. At those resolutions the monitor can support refresh rates of more than 70 hertz.

The monitor features power-

down circuits to automatically cut power consumption when the display is not being used.

The monitor meets the Environmental Protection Agency's Energy Star specification for low-power consumption and also VESA's power-management

**The larger screen allows users to display an entire page of a document at once.**

ment specification, so the display's power management will work with any CPU that also supports VESA and Energy Star. (See related story, page 24.)

The monitor automatically adjusts its vertical and horizon-

tal scan rates to match those of whatever video card users install. Horizontal and vertical ratios can be adjusted by hand using the horizontal and vertical hold control on the monitor's front panel.

The display comes with a tilt-and-swivel stand as well as front-access digital screen controls. These include auto-gaussing, for protecting the display from the CRT's high voltage; a sizing control that can make the display field smaller or bigger; contrast; and brightness.

The low-emission monitor meets Swedish MPR-II guidelines. The screen is dark-tinted with an antistatic coating to keep off dust. Its etched and polarized finish reduces glare.

All Samtron monitors will now come with a two-year parts and labor warranty, Samtron also announced last week.

The SC-528MXL monitor will ship for \$659. It is scheduled to ship in August.

Samtron, in La Mirada, Calif., is at (310) 802-8425.

## Exabyte to sell brand-name DAT drives

BY SHAWN WILLET

Original equipment tape drive maker Exabyte Corp. said it will sell its products in the retail channel under the Exabyte name for the first time.

Exabyte-brand quarter-inch and DAT drives should make their way to dealers and distributors within the next 30 to 60 days, according to company officials.

The drives will be sold as full solutions, with drivers for NetWare, Windows, and other desktop operating systems.

The company said it is consolidating its recently acquired distribution arm, Tallgrass Tech-

nologies Corp., directly into the Exabyte organization and will stop making Tallgrass brand-name tape drives.

"After we acquired the quarter-inch and 4mm [DAT] products, we realized we needed an other distribution channel," said Kris Garrett, director of corporate communications for the Boulder, Colo.-based company. "This doesn't interfere with our OEM customers at all because most of them are using 8mm."

The exact product names and pricing have not been established for the Exabyte retail line, but Exabyte officials said it would closely resemble Tallgrass' offerings.

Higher end offerings, such as 8mm tape library products, could also be offered through the retail channel, according to officials.

Exabyte made a name for itself manufacturing 8mm tape drives and selling them to systems makers and value-added resellers, who then put their own names on the drives.

In the past year, the company has acquired makers of 4mm DAT and quarter-inch tape backup technology. (See "Exabyte buys Tallgrass, Everest mass storage," February 8, page 25.)

Exabyte can be reached at (800) 392-2983.

## Product Spotlight

### 486 color notebook debuts



Adding its name to the growing list of 486 color notebook vendors, Chaplet Systems USA Inc. is shipping a 6.6-pound model with a 10-inch active matrix display. The NBD 486 DX-33T uses a 33-MHz Intel 486DX chip. It ships with 4MB of RAM, expandable to 32MB; DOS 6.0; a PCMCIA Type II slot; an integrated trackball; and one of three hard drives. Its \$325 expansion chassis has two ISA slots.

The computer, now shipping, costs \$3,499 with the 80MB hard drive, and \$3,699 with a 200MB drive.

Chaplet can be reached in Sunnyvale, Calif., at (408) 732-7950.

## Altura launches low-priced 486 color notebook line

BY YVONNE L. LEE

Altura Computer Systems is now shipping a low-cost line of color 486 notebooks.

The Tura line includes both active and passive matrix screen models with a 10-inch display.

The five notebooks use one of three Intel processors: a 25-MHz 486SX, a 33-MHz 486DX, or a 66-MHz 486DX2. Altura offers passive matrix models based on each of the processors; it offers active matrix models based on the 486DX and 486DX2.

Other features include:

- 4MB of RAM, expandable to 12MB;
- a 120MB removable hard drive, upgradable to 180MB or 200MB;

- an integrated trackball;
- a nickel-metal-hydrate battery;
- a PCMCIA Type II slot; and
- an internal floppy drive.

The computers also have a removable-option module for installing a fax/modem, a SCSI port, or a PS/2 mouse port.

The company estimates battery life at about 2 hours.

Pricing for the 5½-pound computer begins at \$2,695 for the Tura-25PC, which uses a 25-MHz 486SX, has a passive matrix display, 4MB of RAM, and 120MB hard drive.

The \$3,995 Tura-66C has the same memory and hard drive but uses a 486DX266 and has an active matrix display.

Altura, of Manitou Springs, Colo., is at (719) 685-5502.

## DTK unveils desktop, notebook, and motherboard products

BY TOM QUINLAN

NEW YORK — DTK Computer Inc. took advantage of PC Expo last week to introduce desktop systems, a color notebook, and its first motherboard products that incorporate either VL Bus-compliant or Intel Corp.'s Peripheral Component Interconnect (PCI) chip sets.

The Grafika 4VL features the first implementation of the VESA VL Bus specification by DTK and offers two VESA

slots along with five standard ISA slots.

At an estimated price of \$2,349, the Grafika is configured with 8MB of RAM, a 240MB hard drive, local bus video and IDE hard drive controllers, and a 14-inch color monitor.

A bare-bones system featuring the VL Bus is scheduled to ship later this month with an estimated street price starting at \$1,599. The Feat-03 system can incorporate a variety of 486 processors and comes with 8MB

of RAM and 1MB of video RAM.

DTK will offer the system in a tower or desktop chassis, and a Pentium OverDrive upgrade socket is also available.

As part of the Environmental Protection Agency's Energy Star program, DTK also introduced a desktop system designed to meet the federal agency's requirements that the computer can shut down system functions

when not in use and use less than 30 watts when in sleep mode. The low-power system is not scheduled to ship until the fall, and DTK has not set pricing.

Also coming in the third quarter from DTK will be a 33-MHz 486SX-based notebook with a dual-scan, passive matrix 10-inch display.

Equipped with 4MB of RAM and an 80MB hard drive, the color DSN-3340C is expected to

sell for \$2,299. DTK will also make a monochrome version of the notebook available, the company said.

DTK is not neglecting Intel's PCI local bus implementation. The company also announced plans to develop a 486-based, PCI-equipped system this fall.

The company will offer a Pentium-based motherboard with a PCI chip set in the same time frame, the company said.

DTK, in Los Angeles, can be reached at (818) 881-8880.





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HP Support Assistant, a CD-ROM-based library, is included to provide lots of valuable technical information.

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These new HP NetServers lead the pack in reliability. RAID-based disk arrays on the LM provide advanced fault tolerance. And, thanks to our hot-swap capabilities, you can now replace an internal drive without bringing the server—or your network—down. The array will also automatically rebuild data on a failed drive. And for maximum protection, the LM even supports Error Correcting Code memory. In fact, the more critical your data, the more critical these servers become.

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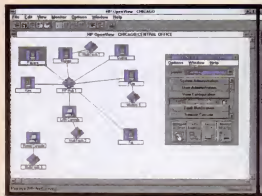
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weather, you'll be happy to know that HP's NetServers are designed to keep pace. And keep your investment protected. Both the LE and LM fit smoothly into multi-vendor environments. The LE is the ideal entry-level server.

Upgradable to the future Intel OverDrive Pentium™ technology-based processor, it provides affordability, exceptional serviceability and future scalability. Built to meet the full demands of the Pentium processor, the LM will also support dual symmetric multiprocessing. Its Power Cabinet allows room for expansion with nine front-accessible mass storage shelves, eight expansion slots and maximum memory capacity of 384 MB.

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**\$4,849\***

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- High fault tolerance with internal RAID disk array option (RAID 0, 1, 5, 6)
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- 128-KB and 256-KB external cache
- 9 mass storage shelves, 3.5" floppy disk drive standard, maximum 8-GB internal storage
- 8 EISA-2 with Enhanced Master Burst bus-master I/O slots
- Integrated Fast SCSI-2, IDE and video controllers
- HP NetServer Assistant software included
- 3-year on-site, next-business-day limited warranty
- Tested and certified on major network operating systems

## HP NetServer LE

**\$2,649\*\***

- 33-MHz Intel 486 SX, 33-MHz Intel 486 DX and 66-MHz Intel 486 DX2 processors
- Upgradable to Intel OverDrive Pentium technology-based processor when available
- 4-MB and 8-MB standard RAM, 128-MB maximum memory
- 256-KB external cache
- 4 mass storage shelves, 3.5" floppy disk drive standard, maximum 3-GB internal storage
- 5 EISA bus-master I/O slots
- Integrated Fast SCSI-2, IDE and video controllers
- HP NetServer Assistant software available as an option
- 3-year on-site, next-business-day limited warranty
- Tested and certified on major network operating systems

## HP NetServer Assistant

Easy-to-use centralized management based on HP OpenView's leading network management environment allowing multiple servers in multiple sites to be managed from a single graphical map.

Problem identification and resolution tools including diagnostics, configuration information (whether the network operating system is up or down), disk capacity planning and technical information via a CD-ROM-based library.

Remote management capabilities allow administrators to use the same tools whether at their local console or a remote PC.

Open architecture facilitates adding specialized third-party or HP management utilities.

\*U.S. list price for HP NetServer LM Model A00, including 486/50MHz processor, 16-MB RAM and 256-MB SCSI hard drive. \*\*U.S. list price for HP NetServer LE Model C01, including 486/33MHz processor, 4-MB RAM and 160-MB IDE hard drive. Prices subject to change without notice. Pentium and the Intel Inside logo are U.S. trademarks of Intel Corporation. © 1993 Hewlett-Packard Company. PPG666.

HP NetServer LE



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PACKARD**

# Legacy SmartArray eases management of wide area networks

By STEVE POLIKI

NEW YORK — Legacy Storage Systems Inc. introduced last week at PC Expo a new SCSI disk array subsystem for network servers running under NetWare, Unix, or LAN Server.

Legacy SmartArray, offering redundant array of inexpensive drives (RAID) protection up to Level 5, is a nine-device

cabinet with maximum storage of 12.6 gigabytes. The storage devices, either disks or tape drives, can be changed while the array is running.

Monitoring and error-notification features in the system's software are designed to make it easier to control disk resources spread across a wide area network.

"Managing a network's remote arrays



can be a major cost. SmartArray helps minimize service and support," said Mitch Vines, Legacy marketing director, who noted that the subsystem can visibly and audibly signal the failure of a fan or power supply.

The array software sends notification of a failed drive to a network operator console and optionally to other nodes.

Sensors detect temperature fluctuations and alert an operator to specific disk failures. Fans and power supplies are both hot-swappable and redundant.

SmartArray's broad network support also provides a generic disk solution for companies that must support a variety of networks, Vines said.

The disk array, now available for OS/2, NetWare, and Unix, will support Windows NT servers when Microsoft Corp. incorporates RAID, he said.

Legacy also expects to soon support 2.1-gigabyte hard drives, which will in-

## IBM Client/Server Office Software.

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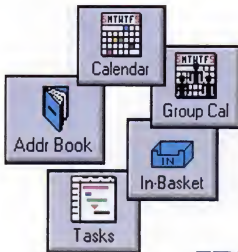
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## SmartArray reduces service, support for network managers.

crease maximum storage to 18.9 gigabytes per array.

Vines said SmartArray improves on the company's earlier line of disk arrays with faster write performance, on-line rebuild, and overall throughput. Write operations are bunched before they are performed, and users can expect a better than 30 percent improvement in overall array performance, he said.

Pricing for SmartArray begins at \$7,460 for one cabinet with three 425MB drives and three 250-watt power supplies. An array fully configured with eight 1.1-gigabyte drives, a 4-gigabyte DAT drive, and RAID Level 5 software is about \$28,000.

Legacy, based in Hopkinton, Mass., can be reached at (508) 435-4700.

## Panasonic 486 notebook uses 3.3-volt system

NEW YORK — Panasonic Communications & Systems Co. introduced a 486SLC-based version of its CF-1000 notebook at PC Expo last week.

Like the CF-1000, the new CF-1000A will use a 3.3-volt power system, allowing it to use less power than a similar-weight notebook that uses the more common 5-volt architecture.

The CF-1000A, weighing 5 pounds, uses a 25-MHz Cyrix 486SLC chip instead of the Advanced Micro Devices Inc. Am386SLX chip of its predecessor.

It has an 80MB hard drive. The company plans to offer the notebook with 120MB hard drive by using a 25-MHz Cyrix 486SLC and CF-1000A use nickel-metal-hydride batteries and have a removable floppy drive that can be replaced with an extra battery on long trips.

The computer includes the SuperStor disk compression utility to squeeze more data and software into the disk drive.

The CF-1000A is scheduled to ship in July for \$1,999.

Panasonic, in Secaucus, N.J., can be reached at (800) 742-8086.

—Yvonne L. Lee



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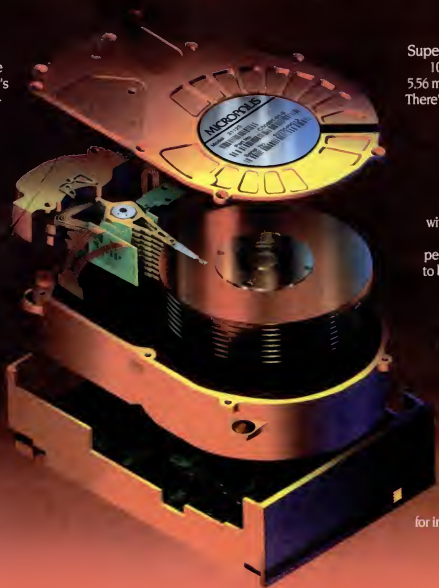
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MODEL NUMBER	CAPACITY (Formatted)	AVERAGE LATENCY	AVERAGE SEEK	TRANSFER RATE (MB/s)	5-YEAR WARRANTY
2105 A	560 MB	5.56 ms	10 ms	5 max	Yes
2112 A	1,050 MB	5.56 ms	10 ms	5 max	Yes

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"...my station is frozen"



"...too many open files"



"...General failure."



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AlertVIEW's proactive *Application Agents* react automatically to almost any application failure by sending an *Application Alert* to the Network Manager. Each alert includes a detailed message and diagnostic information that pinpoints the problem source.

The Network Manager then can correct the reported problem remotely. Once corrected, AlertVIEW records the solution to the problem as a *corrective procedure*. This procedure is then automatically activated if the problem reoccurs on any PC workstation.

It's just that easy! By removing the guesswork, AlertVIEW gives you more free time for network planning and improvement.

### The critics agree

"Now that Superman is dead, network managers who want to take a look inside their workstations to see how applications interact can rely on AlertVIEW...Shany's AlertVIEW can be used to define corrective actions that are executed automatically, whenever a predefined alert triggers them. Thus problems can be solved even when the management console is unattended."

Data Communications, January 1993, Hot Product award

"AlertVIEW is a powerful assistant for any LAN administrator... It is a useful tool for network administrators as well as people working at help desks and computer resource centers."

PC Magazine, March 16, 1993, First Looks



"... When we simulated errors over our network, AlertVIEW did a very good job of identifying what happened and what we should do about it." Lan Times, August 20, 1992

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# The strongest link between your Mac and Oracle Server.



## *Introducing 4D Oracle, the premier Macintosh-based software for connecting to Oracle Server on any of 85 different platforms.*

### The Future of the Connected World

Taking advantage of the Macintosh as the front-end to multiple database platforms is becoming the solution of choice for client/server environments. The Macintosh autoconfigurability and protocol stacking, when combined with the multi-tasking characteristics of 4th Dimension, allow clients to simultaneously connect to several hosts.

At ACI, we support all levels of cooperative multi-vendor computing, from terminal emulation to distributed processing. Combined with 4D, our connectivity modules address two major requirements in database development today: scalability and reduced development time.



### 4D Oracle Connectivity Module

4D Oracle is a set of routines that connect 4th Dimension—the best selling relational database on Macintosh—to Oracle Server running on any platform. Transparently managed by 4D, these routines access the power and functionality of both 4th Dimension and Oracle Server. To make the connection, all you need is SequelNet 1.2 or greater.

### The Best for Both Worlds

4D Oracle provides features unavailable in any other Macintosh-based solution. 4D Oracle allows users to establish dynamic links between data objects in

4D—such as fields, variables, arrays—and Oracle data objects with a simple point and click. After the links have been established, users can perform any database tasks such as searches, updates, inserts, etc. Once these query definitions are built, 4D Oracle can generate code to accomplish the same tasks procedurally. To move an existing 4D application to Oracle Server, 4D Oracle provides a cloning feature to create an Oracle table that mirrors a 4D file.

### The Basics—Macintosh as Emulator

The most basic service expected from a client/server architecture is the ability to query and display data residing on a host. 4D Oracle allows full customization of query dialog, extensive capabilities for data display and navigation inside the data, retrieval from several hosts simultaneously, and control over the volume of information sent to the client.

4D Oracle's graphical interface has advantages over text-based systems. But attractive screens are only a small part of this. Visualizing data graphically provides a quicker perception of its meaning.

### Working Closer with the Host

The quality of interaction between 4D Oracle and Oracle Server is facilitated by the fact that 4D itself is a powerful database, able to work at the structural level with host databases. It is easy to create a 4D structure which is a twin of an Oracle database, ensuring data integrity during updates on the hosts. 4D Oracle provides two main advantages during data entry and modification which improve user productivity: built-in and easy-to-use tools for a pre-check of data accuracy during data entry, and high flexibility for data update and modification.

### Macintosh Central Command

Usually, micro-computer tools are viewed from the data manipulation standpoint. With collaborative processing, 4D Oracle on the Mac now acts at the structural level to facilitate database management.

4D Oracle and other ACI connectivity products, enable the design of tools which help develop and maintain host databases. Administration, maintenance and general monitoring of systems are now the domain of the Macintosh with 4D at its core.

### Developing Client Applications

4D Oracle has the same development environment found in 4th Dimension: a Procedure editor, high quality programming language, interactive debugging tools, flexible Layout editor, efficient programming add-ins, and multi-user development. A database created with 4th Dimension and 4D Oracle is easily delivered to multiple users by simply opening it with 4D Server, ACI's new client/server database for Macintosh.

### Multi-user Development

By using 4D connectivity modules, Macintosh users may be connected simultaneously to 4D Server and other databases such as Oracle, Sybase, RDB, DB2 and more. And because 4D is multi-tasking, users can perform operations on data from several different sources at the same time.

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Call (408) 252 4444 ext. 246, and we'll send you a 4D Enterprise Brochure which completely describes ACI's connectivity products—4D Oracle, 4D SQL Server and 4D DAL. See how 4D Oracle and 4th Dimension link you to the data you need most.

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## NEWS / NETWORKING

## PIPELINE

## UPGRADE

## Intel supports direct fax routing to users

Intel Corp.'s upgrade to its Net Satisfaxion fax software package supports direct inward dialing for automatic inbound routing of faxes to individual users. With the enhancement, users get their own phone numbers, which lets outside users send faxes directly to them. Net Satisfaxion 2.0 is available now, priced at \$995 for a 20-user version. (800) 538-3373.

## SHIPPING

## Microsoft updates gateway to X.400

Microsoft Corp. began shipping Version 3.2 of its gateway to X.400 recently. Version 3.2 includes support for an Open System Interconnection LAN standard called TPC/CLNP, which is used mostly in Europe but is an emerging standard in the United States. Support for TPA/CLNP in the X.400 gateway gives users simultaneous LAN and WAN connectivity and lets them more fully utilize the Ethernet network. The gateway is available through Microsoft resellers for \$4,995.

Digital Communications Associates Inc. is shipping Comm Server 1.3, an OS/2-based client/server software for LAN Server, LAN Manager, or compatible LANs. The server adds support for IBM's OS/2 2.0 and LAN Server 3.0 as well as support for 802.2 over Ethernet and DCA's new line of Token Ring adapters. Comm Server 1.3 also has been repackaged to support DCA's workstation MultiPak strategy, announced in February. The product supports most of DCA's Imma product line. Comm Server is available now for \$2,995, with upgrades starting at \$449. (800) 348-3221.

## ANNOUNCED

## MCI readies MCI Mail gateway to QuickMail

MCI Telecommunications Corp. has announced an MCI Mail gateway for QuickMail, the LAN electronic mail package for the Macintosh. QuickMail MCI gateway users can now exchange E-mail messages, text, binary files, MacBinary, and spreadsheets with MCI Mail Mail servers and with users of the Internet and 54 public E-mail systems worldwide. QuickMail users also gain access to MCI Mail services such as fax and fax. The gateway will be available this month for \$295. (202) 872-1600.

## Is Notes in tune with your business?

Lotus Notes is designed to handle four main types of applications

**Tracking** - Helps users follow what is happening in their business, such as sales trends, purchasing, etc.

**Broadcast** - Used to deliver announcements or post information about a particular business to a large number of PCs.

**Reference** - Stores and helps users sift through fairly static information, such as research reports.

**Discussion** - Enables group discussion, both in a structured and an ad hoc manner.

## Users trumpet Notes for some applications

Groupware tool is better suited to documents, text than numbers

BY DOUG BARNEY

With Lotus Development Corp.'s Notes 3.0 out for three months now, users are considering a move to groupware.

The major Notes upgrade lets users share files across multiple LANs with its centralized data dictionary and gives Notes' servers a directory of users and accessible files.

The upgrade offers added storage and full-text search and retrieval.

Other groupware goodies include multimedia support and code that lets Windows applications store files in Notes.

Despite all the extras, current Notes users are advising would-be Notes managers to do some homework before deciding to upgrade.

They recommend that managers design Notes applications for at least four users. And they suggest Notes be used for appli-

cations that rely on documents and text—such as in sales, support, and human resources—and not accounting applications that primarily use numbers.

"The biggest reason to use Notes is if you have information-type systems," said Ed Catlett, assistant vice president of Johnson & Higgins, a New York-based insurance brokerage. Notes is strongest at disseminating information, particularly for laptop users who need to get at the same applications and information being used on the desktop, he said.

Lotus officials admit that applications such as on-line transaction processing (OLTP) are not best suited to Notes.

Notes is a distributed database that is updated at intervals, unlike an OLTP system that is constantly being updated. Would-be Notes managers should also be concerned about

See NOTES, page 38

## Cabletron beefs up its stackable hubs

Bridging, routing can be added

BY JAYNE WILSON

Cabletron Systems Inc. is adding a product twist to the flood of stackable Ethernet hubs hitting the market by offering integrated bridging and routing capabilities.

Like its competitors, the MicroMMAC hub provides an easy-to-use, inexpensive solution for remote offices. But unlike the rest, MicroMMAC (Multi Media Access Center) is an intelligent modular Ethernet hub with 12 or 24 ports.

Its bridging and routing are added by optional bridge or router interface modules (BRIMs) that plug into the hub. The BRIMs support Point-to-Point and Frame Relay protocols.

Built in to the BRIM is a channel service unit/data service unit (CSU/DSU) for connectivity into the wide area network.

"Previously, users wanting to connect remote office stackable [hubs] to the main office would have to buy the stackables from one vendor and perhaps a router from another and also would have to purchase a CSU/DSU unit," said Tom Coburn, Ethernet product manager.

The MicroMMAC hub is SNMP manageable and features Distributed LAN Monitor software, which locally polls all the network devices at the remote site.

Cabletron's Hub-stack line also includes the SEHI stackable

Ethernet intelligent hub. The SEHI does not incorporate a BRIM slot or CSU/DSU. It comes in 12- and 24-port models.

All of the intelligent hubs are based on the Intel i960 RISC processor.

Completing the Hubstack line are 12- and 24-port SEH non-intelligent hubs, which do not include management features.

The MicroMMAC and SEHI hubs can be stacked with up to four of the SEH hubs to create fully manageable networks of up to 130 nodes.

All hubs will ship in September. The MicroMMAC hubs are priced from \$4,895, the SEHI hubs from \$2,395, and the SEH hubs from \$1,395. BRIMs will be available in the third quarter, priced from \$1,495.

Cabletron, in Rochester, N.H., can be reached at (603) 332-9400.



Cabletron's MicroMMAC hub is an intelligent Ethernet hub with 12 or 24 ports.

## End-user group offers help in buying and managing computers

BY TORSTEN BUSSE

IS managers can now get help designing effective strategies for managing computer assets from an end-user-sponsored service organization.

The PC Assets Management Institute (PCAMI), which announced its formation last week, is a group open to corporate and government PC and LAN managers who want guidance in managing desktop assets.

"We found that when it comes to managing PC assets,

many organizations are trying to reinvent the wheel," said Timothy Poley, PCAMI executive director. "We saw a need for a clearinghouse for assets management-related information."

Decentralized purchasing procedures, limited PC management strategies, and the ongoing downsizing trend all contribute to the situation, Poley said.

The PCAMI's research shows that corporations lose as much as \$20 billion annually as a result of ineffective or nonexistent assets management procedures.

"If you ask a company how many miles their car fleet rolled up last month, you get a very detailed answer," Poley said. "But the same company will tell you how many PCs they own."

The PCAMI will offer services that help its members maintain control of the assets they manage. Specifically, it will publish a quarterly newsletter and a handbook for developing PC assets management strategies, provide access to a BBS and a research library, and

sponsor management forums.

The Institute will also issue a series of reports on asset management-related issues.

The advisory board includes members from Eastman Kodak Co., Citibank, and the Software Publishers Association.

Memberships are \$295 through September and \$395 afterward. A group membership for up to 10 managers will be \$2,000 through September and \$3,000 afterward.

The PCAMI, in Rochester, N.Y., can be reached at (800) 722-6487.



# Upgrades shipping for three asset management packages

## LANlord, LAN Directory, LT Auditor updated

BY TORSTEN BUSSE

Three network management firms are shipping upgrades to asset-management packages that offer broader operating system support and more flexibility for customizing applications.

• Version 2.0 of Microcom Inc.'s LANlord inventory and network monitoring software now works with Microsoft Corp.'s LAN Manager, IBM's LAN Server and NetBIOS networks, as well as Novell Inc.'s NetWare.

The company also integrated its remote control software Carbon Copy for Windows into LANlord, which allows administrators to remotely troubleshoot networked PCs.

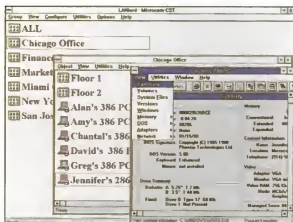
The software offers full remote keyboard and mouse support. This also allows managers to remotely configure systems files prior to adding new applications to the network.

LANlord also adds alert-forwarding capabilities based on major messaging and networking protocols, including Dynamic Data Exchange and Vendor Independent Messaging.

The software also adds support for multiple LANlord servers and SNMP proxy agents, so it can connect with other third-party SNMP-based management stations.

A 50-user license of LANlord is priced at \$2,495.

• Fry Computer Systems Inc.



Microcom integrated Carbon Copy into LANlord, allowing managers to remotely control PCs on a network.

is shipping Version 1.5 of its \$495 LAN Directory software and hardware inventory application, which runs on all major network operating systems including NetWare, LAN Manager, LAN Server, Banyan Vines, and Digital Equipment Corp.'s Pathworks.

The company added more than 50 user-definable fields that allow managers to design their own screens to track unique configuration information.

LAN Directory's software tracking options have been enhanced to detect applications by version number, name and/or size, range, and date. Users can now set up modules to track data on PC peripherals and interface cards, scan for unknown files, and gain access to a command-line remote power timer.

• Finally, Blue Lance intro-

duced a \$995 NetWare Loadable Module version of its LT Auditor auditing, metering, and inventory software optimized for NetWare 3.x environments.

Compared with previous versions, LT Auditor 4.0 does not require any TSR agents. Its reporting features also have been enhanced so LAN managers can determine the number of licenses required for each application.

LT Auditor's security features now log any unauthorized log-in attempts and offer real-time notification options. The package also tracks changes made to CONFIG.SYS, NET.CFG, and AUTOEXEC.BAT files.

Microcom, in Yonkers, N.Y., can be reached at (800) 822-8224. Contact Fryc, in Boston, at (800) 234-3793. Blue Lance, based in Houston, is at (713) 622-6236.

# Chipcom modules can segment LAN traffic

## Heavy-bandwidth applications can be isolated to improve flow

BY JAYNE WILSON

Chipcom Corp. is shipping a family of intelligent switching, bridging, and routing modules for its OnLine hubs that will let managers segment Ethernet networks to accommodate bandwidth-hungry applications.

"Users can segment high-bandwidth users — such as CAD/CAM users — to their own private network, as well as the traffic needed to get to or from those users would go over that network," said Dan Koranski, Chipcom product manager of internetworking products. "So you've essentially divided the Ethernet into two for 20Mb total."

The OnLine Ethernet Interconnect Modules come in three levels of functionality: switching; switching and bridging; and switching, bridging, and routing. All modules use common hardware, so they can be upgraded with software to higher levels of functionality.

The modules come with error checking to eliminate the transmission of bad packets, which can increase network traffic and even plug networks down, Koranski added.

The modules use an Intel Corp. 8600 RISC processor and consist of two boards that plug into two slots in Chipcom's OnLine System Concentrator. They support TCP/IP, Novell Inc.'s IPX/SPX, and Digital Equipment Corp.'s DECnet protocols. The modules provide connections to as many as six net-

works and can forward 64-byte packets at speeds of up to 42,000 packets per second.

The switch module is aimed at users who want to split up high-traffic networks into smaller segments.

The bridge module lets users segment, filter traffic, implement security, and find the shortest path between two points. In addition to switching

## All modules use common hardware, so they can be upgraded with software.

and bridging, the bridge/router finds also routing protocols to find the most cost-effective path.

Chipcom's Bridge Module will be available in the third quarter for \$8,495. The Switch and Bridge/Router Modules will be available in the fourth quarter, priced at \$5,995 and \$10,495, respectively. The modules can be managed by built-in SNMP agents or by any SNMP management platform.

Software upgrade kits are priced from \$4,000 to \$7,000.

Chipcom, in Southboro, Mass., can be reached at (508) 460-8900.

structure.

Because even Lotus knows that getting Notes running can be involved and frustrating, the company has outlined four standard jobs first-time users should assign to managers:

- The Notes administrator maintains the servers, supports users, creates new accounts, loads software, handles server maintenance, and performs replication.

- The Notes support engineer installs and tests Notes and handles troubleshooting.
- The database manager manages a particular database and handles the access control list, which determines what users can do within Notes.

- The Notes certifier creates IDs for Notes users, ensuring that proper security precautions are taken. "Notes is highly security and access-control conscious," Rogers said. "That is why there is the certifier. Notes has levels of granularity of access."

And for managers with personnel left over, a database designer can be designated to build and test in-house applications.

"In the beginning it was frustrating," said Jim Bright, director of business systems for Canadian National, the Montreal-based national railway service. "People couldn't modify the application, and it was like, 'Oh, IIS is not servicing us properly.' Then, two guys took it upon themselves — part time — to spearhead the work. Now we have two full-time people and have put a group together to develop applications."

## NOTES / from page 37

### Users trumpet Notes for some apps

whether the applications will be used for intense jobs such as systems and database management that require a lot of oversight.

"Managing Notes is not free," Catlett said. "You need the people to administer and support the database. You have to have technical people who understand how the servers talk to one another. You have to do disk-capacity planning, because you are keeping duplicates of your database in various locations."

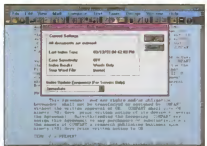
Managers are required to know how to administer and replicate each database. Grappling with replication, which involves updating and synchronizing databases at intervals, can take some getting used to, say Notes users and Lotus officials. Notes offers local or central

replication control.

With local control, users set their own schedule for selective replication (copying and synchronizing of databases). Although some managers may cringe at trusting users to do this, it lowers dial-up charges because a remote computer is not necessary.

Central replication gives the manager control, allowing him or her to issue replicated databases to other servers and expanding users' access. Managers choose from seven different levels to set up access privileges for Notes users. The manager can also control what to replicate and how often.

"People have to understand the value and trade-offs of partial connectedness and replication," said Terence Rogers, vice



Custom buttons in Notes let users design features for routing and tracking work.

president of development for Lotus' communications products division. "For people who use it to a database as a single thing that you protect, Notes is a very funny animal."

Once Notes managers have defined the number of users and the intensity of use, they can determine the system's requirements and its management

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But when one comes along, we'll give it to you free.

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## TO THE EDITOR

### Long live the command line

I couldn't agree with Ed Foster's June 21 editorial more. (See "Some software should be hard to use," page 35.) Whoever said that an experienced user wants to spend all that time clicking mice?

All programs should be the way early Windows (or late DOS) programs did: with alternate speed-key combinations to bypass all that junk for the most commonly used functions.

There should also be some macro programming capability to let experienced users create their own shortcuts for whatever they want to do most often.

Ed's point needs to be repeated, and, often, to software developers. At this time, you might almost say there are as many experienced users as there are novices—who else has been hating all those high-end machines?

Ron Acher

Microcomputer Manager  
New York

### Hawking LANs

It seems in all the coverage of the impending battle between Microsoft and Novell that one of the most important aspects has been missed: Microsoft has a "sell them cheap, sell them cheap" attitude, which is the exact opposite of Novell, which is used to overcharging for its products. Being able to buy a 20-user version of NT for \$99.95 at your local store, I think, changes the whole equation. Novell has a 20-user version of NetWare for \$1,000. Neither subsequent releases nor Word for Windows or the Macintosh products have anything to do with that brilliant product. The real Word was the first page- and object-oriented word processor, and even today its networkable style sheets (not "styles") but the short and awesome untapped power for network administrators.

If users were to start buying network products on price, then Novell would be in dire straits. NetWare at the moment is the superior product, but if Microsoft slashes the prices of NT, then despite its problems, people will buy it.

Jason Westwater

CompuServe: 76620,3255

### Upgrade hell

Ed Foster's June 14 column ("Users must often learn hard truths about vendor loyalty," page 53) was a rare and welcome recognition of the ugly treatment Word users have received from Microsoft. The history of the "real" Word ended with Version 5.0B. Neither subsequent releases nor Word for Windows or the Macintosh products have anything to do with that brilliant product. The real Word was the first page- and object-oriented word processor, and even today its networkable style sheets (not "styles") but the short and awesome untapped power for network administrators.

Word's original interface was designed for typists, unlike Windows, which was designed in a vacuum by people who can barely recognize a keyboard when they see one. In terms of keystroke efficiency, Word 5.0B is unrivaled, especially on an original PC-AT style keyboard.

Despite occasional reminders from leading columnists, Microsoft has stubbornly refused to respond to criticisms of the clunky CUA interface it pushed on Word. Senior Microsoft executives

would not answer letters calling for a return to the original interface. Microsoft has totally forgotten what Word was all about and cares not a whit about speed typists.

Malcolm Dean  
Los Angeles

### Tortoise of spreadsheets

As a long-time user of Lotus 1-2-3 for OS/2 and Freelance Graphics for OS/2, I found John Walkenbach's appraisal of the product to be quite accurate (June 14, page 80). 1-2-3 is relatively sluggish, and the interface has its share of quirks. Release 2.0 is somewhat disappointing. Many of us had hoped for additional editing options and improvements in text handling.

However, in grading performance, it should also be said that 1-2-3 and Freelance are true industrial-strength products. As an engineer and programmer, I regularly write and debug programs, run them, load large quantities of data into 1-2-3, generate plots and place them into Freelance. Often this is done while exchanging information with other computers on a network. The advantages of a spreadsheet that doesn't crash under stress can't be overstated. Windows spreadsheets offer some nice features. Unfortunately, experience shows that Windows software is not sufficiently robust and doesn't take full advantage of OS/2's advanced features.

In general, I agree with Walkenbach that it is worthwhile to look at other options. Perhaps, if Microsoft or Borland will take notice of the rapidly growing ranks of OS/2 users.

Richard E. Hodges

Electrical Engineering  
University of California, Los Angeles

### Conference feedback

When I first noticed the Perspectives 93 conference aims and goals, I inquired for additional information. (See Distributed Thinking, May 31, page 4.) I received the information promptly and proceeded to examine my schedule and travel/education budgets. Unfortunately, due to the short lead time combined with the fact that my travel/education budget for the second quarter was already depleted, I was forced to pass on registration.

I believe your conference idea has merit and would prove very advantageous to persons in my position in other companies, just as I depend upon NetWorld, Comdex, Gartner Group OIS Conference, and PC Expo to provide me with information on software and hardware directions in both a marketing and educational format. From my standpoint, rescheduling the conference to an October or March date would provide needed distance from the other major conferences that I need to attend. This would also permit me to budget for the conference (which is a fact of corporate life today).

Please do not abandon the goal of a vendor-independent conference for discussing the management and reality issues that the PC market generates.

The industry needs more conferences that open dialog and generate ideas and solutions rather than demonstrate marketing hype and glitz.

Ronald Mechsner  
Technology Analyst  
Mercedes-Benz North America Inc.

### Gigabucks in action

I was intrigued by Bob Metcalfe's suggestion on how to see my taxpayer dollars at work. So I called (800) 772-1213. The phone was answered on the first ring by an articulate and friendly human, who transcribed my name and address to the unmistakable tune of an IBM Selectric typewriter. I was asked to redictate my last name and address upon perhaps the same form for my wife. Perhaps in the age of Touch-Tone tornado, it is worth a gigabuck or two to get personal service.

George Kwiatkowski

Administrator  
Kauff, McClain & McGuire  
New York

### On-line lawyering

An article in the June 14 issue of *InfoWorld* entitled "Legal firms boost efficiency with lawyer websites" (page 60) had the right title but painted an incomplete picture. Law firms have been investing heavily in information technology for the past several years and have done so to promote better service to their clients, reduce costs, and improve efficiency. It may be true that "fewer than 40 percent of lawyers have computers at their desks," but in virtually all large firms most lawyers (as well as paralegals and staff) not only have a computers at their desks, but they use them regularly. Almost a year ago, the annual survey conducted by the Chicago-Kent College of Law reported that in 151 large law firms (more than 25,000 lawyers total), 70 percent of the lawyers used computers.

Firms like ours have state-of-the-art local and wide area networks, dozens of client E-mail connections, and use technologies such as image and text management.

I would not hold out the legal profession as more advanced in the use of information technology than most other professions, but I argue with the ABA survey results. Highlighting only the ABA survey of medium-size law firms, however, leaves out an important part of the picture and thus gives an incomplete assessment of the use of technology in large firms.

Christopher K. Poole  
Executive Director  
Latham & Watkins  
Los Angeles

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From the Editor / Ed Foster

# Vendors aren't the only ones readers are griping about

**B**elieve it or not, the one company that has received more complaints on the gripe line than anybody else is one I haven't talked about yet.

Part of the problem is that there's been such a wide variety of gripes made about this organization that it's been hard for me to decide what to focus on. There's just not enough room in this column to discuss all the black marks it has earned with *InfoWorld's* readers, but let's deal with a few of them here. The name of this dastardly firm? *InfoWorld* itself, of course.

Although it's not the main purpose of the gripe line, I am delighted that it has been able to serve this secondary purpose of informing us about problems readers have with us. It's good to know that if we make a mistake or get off course, they're able to let us know real fast. It's also good to know our readers care enough about the information we deliver to complain about our shortcomings.

The *InfoWorld*-related gripes I like best point out a problem we may not realize we have. A few weeks ago, for example, the "Upcoming in *InfoWorld*" section on the editorial index page incorrectly listed a product comparison for imminent publication that had been postponed. When the issue appeared without the promised comparison, we heard about it on the gripe line, particularly from those who said they had held off on a buying decision until they read our Test Center's findings.

Product comparisons are complex projects from a logistical point of view, and our long-term schedule often has to be shuffled around. What we



discovered from these gripes was that our internal communication system for ensuring everyone knew about such scheduling changes had broken down. Our readers not only need timely information, they need to know when it's coming.

I can't say it will never happen again, but we will do a better job of keeping the "Upcoming in *InfoWorld*" section accurate.

The gripes I don't like are the ones I can't really do much about. Probably the most common *InfoWorld*-related gripes concern subscriptions: people who can't get their own copy, people who have been dropped from the qualified list, people who can't get their address changed, etc.

There's not much I can do for those folks, other than pass on their gripes to the proper authorities in our circulation department. Quite frankly, circulation is a science — or maybe a black art — that even most people in the publishing business understand very poorly. I've been in publishing longer than I care to admit and I still have trouble understanding a conversation between two circulation professionals. A controlled-circulation publication like *InfoWorld* — one that goes to a select readership for free — is even trickier. You might sound like a perfectly qualified reader to me, but that and \$130 will buy you a paid subscription.

Then there are the cases in which we're damned if we do and damned if we don't. Almost as vocal as the subscription gripes, and even more irate, are those mad at *InfoWorld* because of Steve Gib-

son's long delay in shipping SpinRite 3.1. My explanation that *InfoWorld* has to treat Steve Gibson the columnist and Steve Gibson the software publisher as two different guys didn't convince everyone. While I understand the grippers' frustration about not getting a product they paid for six months ago, I still don't understand what they think we should do about it. *InfoWorld* doesn't own Gibson Research, Steve Gibson does. But just watch — now that Steve is taking a break from writing the column while he gets his product out, I have no doubt that we'll get even more calls on the gripe line from Tech Talk fans who want us to make Steve keep writing, SpinRite or no SpinRite.

Speaking of no-win situations reminds me of my all-time favorite *InfoWorld* gripe. It came in just about the same time that we began reporting on the problems we were hearing about Microsoft's DOS 6.0 on the gripe line. Right in the middle of messages about DOS 6.0 — some complaints about the product as well as some complaints about our coverage — was a message from one reader sincerely asking if the rumor he had heard was true. He understood that a relative of Bill Gates works at *InfoWorld*, and he wanted to know if that was why we were always so pro-Microsoft.

Let me just say that, as far as I know, no relation of Bill Gates works here. I guess there must be some other reason we're always so nice to them.

*Ed Foster is editor of InfoWorld. He gets electronic mail at MCI account 584-3453. Or, you can call (800) 227-8365, Ext. 710, to report a gripe you have with a vendor.*

Peer to Peer / Sally Atkins

## We need to feast on open systems fruit rather than be stuffed with suites

*Sally Atkins is an IT consultant at a large East Coast financial institution and a member of InfoWorld's Corporate Advisory Board. The opinions expressed here are hers alone.*

We asked for open systems and instead the PC industry has offered "product suites." I noticed the trend at fall Comdex. It began to sink in around January when Lotus announced the Communications Architecture and brilliantly demoted its suite. It became all but inevitable at spring Comdex.

Large corporations must consider switching from a multivendor hodgepodge of office automation and personal productivity tools to a suite from Borland-WordPerfect, Lotus, or Microsoft.

It used to be you could select the best of a category: a Borland database, Lotus spreadsheet, and Microsoft presentation graphics package. No more. These things just don't work together as smoothly as tools from a single source. Users have to give up the best of breed for interoperability and smooth integration among tools. For now, this will have to do. But in the long run, the vision made possible by standard interfaces and common objects will have to become part of the industry's game plan.

What is this "open systems" vision?

For starters, I'd like my calendar objects to update your calendar objects so we can do lunch even if we don't share the same taste in personal information management software. Ultimately, I'd like to be able to hook up to my corporate partners' systems — without spending years developing an application.

Look at the achievement of the banking industry. To create global automated teller machine (ATM) networks, banks collaborated on standards that

bank, explains the philosophy of shared research and development: "Compete in the morning, cooperate in the afternoon." I wish the software industry would make that their mantra.

Some detractors will say that because banking is a service and software a manufactured product, my analogy won't hold water. However, software packages at \$99 a pop are not the product of the future. Service is.

So listen up, guys: I predict that if

**In the long run, the vision made possible by standard interfaces and common objects must become part of the industry's game plan.**

most directly affected customers' interoperability needs and built their own systems to interface with that specification. Each bank benefits from a larger market created by the collaboration.

Today, most customers won't do business with a bank that doesn't have global ATMs. This interoperability is a cost of doing business. So, too, will interoperability be a cost of doing business in the middle to late '90s for software vendors.

Walter Wristen, former CEO of Citi-

today's leading software vendors do not begin to move toward neutral ground, new open systems software companies will surpass and replace them before the end of the decade. The cost of switching from shrink-wrap is not so high that users are locked in. A service-oriented publishing model based on open standards may even free us from today's new-release-and-upgrade game, a vicious cycle that does not serve users and creates diminishing returns for vendors.

Making the method for sharing objects easy is a big opportunity for the right vendor. It is an area where leadership is lacking from Microsoft, which merely sends in a Windows programmer to create a one-time solution. This is great for getting applications up and running fast but does little for the overall needs of the enterprise in building unique object classes on top of the ones we buy from software companies.

Borland is on the right track with its object-oriented packages. Its new client/server division could turn into a source for IS guidance. What corporate developers are trying to do is not unlike what Borland has begun internally. Philippe Kahn would be wise to leverage his popularity in tools to step into the role of IS guru.

You can't always get what you want, but . . . you get what you need. Product suites are what we need today — but not what we want for tomorrow. By mid-decade we will need more than product suites. And we will want no less than cross-vendor interoperability.

*"Peer to Peer" gives readers a forum for discussing computing and management issues. Send submissions to Rachel Parker, opinions editor (MCI Mail 340-4371). Submissions can also be faxed to (415) 358-1269.*



From the Ether / Bob Metcalfe

## Ada is worth another look, and it's now free

a computer programming language. Give up? OK, the question is, Name two movie stars and a dog.

Yes, almost everybody I know thinks that Ada is a dog. Well, everybody knows that the C language is the cat's pajamas. And if not C, there would be Assembler, Fortran, Cobol, Basic, Pascal (from which Ada was derived), Lisp, or maybe SmallTalk, but not Ada. We called Borland to ask if it is doing Ada; no, Microsoft didn't even bother to return our call — no offense taken.

Ada was developed by the U.S. Department of Defense, the European Community, and others for standardization by ANSI and ISO in 1983. Ada was named after the first computer programmer, Augusta Ada Byron, Countess of Lovelace and assistant to Charles Babbage. In 1991, the U.S. Congress made Ada mandatory (unless accompanied by a note from the Secretary of Defense) for all new DoD software.

Recently, the \$12 billion air traffic control modernization being done with Ada by IBM for the FAA ran into trouble. If they can pin the trouble on Ada, then I suppose Bill Clinton will repeal Ada, especially if it turns out the Countess of Lovelace failed to pay her babysitter's payroll taxes.

You may recall my previous attempts to get you to consider some programming languages other than C. I say that C++ is 25-year-old technology (BCPL plus Simula) from which we had better soon get unstuck. And I think something we might call Visual Cobol++, for example, would be a better programming language for business data processing than

Microsoft's hot new Visual Basic or Visual C++.

And now I'm back to see if I can get you off C onto Ada. I had written off Ada, like many of you, until I ran into Bill Carlson at our 25th college reunion last month. Bill told me that while I was working on Ethernet, he was working on Ada. Since Bill was getting straight A's the last time I saw him, I'm listening now about Ada.

Bill works at Intermetrics Inc., in Cambridge, Mass. (Internet: carlson@intermetrics.com). Intermetrics is under DoD contract to further develop Ada. Bill says that Ada is gaining steam.

## I'm back to see if I can get you off C and onto Ada.

According to Bill there are now hundreds of millions of lines of Ada in service, mostly in DoD applications.

What kind of lines are these? Readable, block structured, with strong typing, separately compiled interfaces and implementations, generic for reusable and tailorable components, multitasking in the language, systematic exception handling, data abstraction, precision specification, and more, all through 600 compilers certified by the National Institute of Technology and Standards.

Ada isn't intended for all kinds of software development. Bill says, just software that you intend to use and maintain for more than a year, software too complex to be written by one person, software that must handle concurrent tasks,

software that is readable, portable, and reusable, and by the way, software that must be highly reliable and perform well. Everything else can be written in C.

Last month in Paris, the ISO working group on Ada accepted a draft submitted by Intermetrics for Ada 9X, which Bill expects will be accepted by ISO as ANSI in 1994. Ada 9X will be object oriented; you probably guessed that.

And also last month, Gnu Ada, a new validated Ada 9X compiler, was demonstrated by New York University. Students and programmers throughout the world who want to use Ada will be able to get an excellent compiler, and its Ada source code, for free. The sources and binaries will be available on the Internet by July 4.

The group that wrote Gnu Ada used existing validated compilers on systems including Sun Sparc, DEC Alpha, and IBM RS/6000 workstations, and most significantly, a notebook PC.

The Gnu Ada compiler is fast. It can compile and link the source code for itself (82,000 lines of text) in 60 minutes on the Sun Sparc/IPC, and in less than 2 minutes on a DEC Alpha.

For more information on Ada, try dialing the bulletin board system at (800) 232-9925.

Some people, like me, think that most things done by government turn out complicated, expensive, and a mess. We're inclined to think that Ada, a DoD standard, can't be any good. I would like to remind those people, and myself, that DoD made TCP/IP a standard in December 1980. And that dog hunts.

So are you ready to switch to Ada?

InfoWorld publisher Bob Metcalfe *invented Ethernet in 1973 and founded Scopus Corp. in 1979. He receives E-mail via the Internet at bob\_metcalfe@info-world.com or at 524-1127 on MCI Mail.*

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**AppleLink:** Some of our editorial staff have personal accounts on AppleLink, including Stewart Alsop (ALSOP), Anne Karp (KARPCZAK), Bob Kayne (KAYNE.B), Kristin Kueter (KUETER), Lia Lorenzano (LIAL), and Tom Quinlan (QUINLAN.T).

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## ENTERPRISE COMPUTING

# WIDE AREA NETWORKING

LAN managers face a whirlwind of connectivity options

BY DOUG VAN KIRK

It should be a simple task. Connect a LAN in Baltimore to another one in Seattle so users can exchange electronic mail and files and occasionally work on a common database. Just buy a pair of routers or bridges and tell the phone company to add a data line.

But what should be a straightforward connection quickly becomes mired in a confusing array of

telephone services, connection devices, protocols, and the unfamiliar lingo of telephone companies.

Wide area networks (WANs) are never easy to create. Unlike the plug-and-play installation procedures of LAN equipment, WAN connections are often highly specific beasts that require a lot of tweaking to get them up and even more tweaking to keep them running.

With so many services available and so many vendors slugging it out, confusion reigns supreme in the marketplace. Competing and often incompatible technol-

gies vie for your data, and complex pricing strategies make it difficult to accurately determine the best and most economical way to connect your LANs.

Make the wrong decision and you could be stuck with a connection that can't expand to meet your needs. Buy too much capacity and you could be paying two to three times as much per byte as with other solutions.

The primary cause of the confusion? The telephone companies. Due to a seemingly endless list of federal and state regulations that carve up the nation's telephone network among local and long-distance carriers, you will likely have to work with two or three telephone companies just to get a connection.

Compounding the problem are different names and pricing structures for similar services, which makes comparison shopping next to impossible, and the fact that some services aren't available in every area. Throw in additional locations and protocols and the confusion gets even worse.

**BANDWIDTH REQUIREMENTS.** Before you can connect two or more LANs, you must make a thorough assessment of your needs—both now and in the future. Assessing bandwidth requirements—the speed at which data can be transmitted—is nearly always the first step.



"You need to think two to three years down the road," says Rick Oberman, a network architect with AT&T Data Communications Services, in Chicago.

Network traffic nearly always expands to fit the capacity of the wire, adds Tony Ferrigno, executive vice president of Omni Tech Corporate Solutions, a Teaneck, N.J., reseller.

Ferrigno recommends studying bandwidth requirements of applications in use as well as those likely to come on-line. He also advises would-be WAN supervisors to set an acceptable response time figure for each application. You don't want to slow down or frustrate users, he explains, but you don't want to buy too much bandwidth for an application when it's not really needed.

A 5-second response time may be acceptable in a database program, he adds, but unacceptable in a word processor.

The wide variety of users and applications makes hard and fast guidelines difficult to establish, but at least one integrator is willing to make some recommendations. According to Leo Spiegel, executive vice president of LAN Systems, in San Diego, E-mail users can typically be satisfied with a 9,600-bit-per-second (bps) connection; screen and keyboard remote control programs need 19.2Kb per second (Kbps) to 56Kbps; file transfer becomes feasible at 56Kbps; and di-

rect application access requires at least 384Kbps. These figures are per-user, which means you should multiply these speeds by the number of concurrent users.

Along with determining bandwidth, you need to look at usage patterns. Obviously, unless yours is a 24-hour-a-day operation, you won't be using the network connection for a large part of the day. But bandwidth requirements also vary drastically between 9 a.m. and 5 p.m.

In many companies, data transmission rises in the morning, peaks at about 11 a.m., falls off during lunch, peaks again in the early afternoon, and declines the rest of the day. However, the nature of your applications may change this norm.

Do users store large files before leaving their desks or going home? A customer service group produces more traffic in the early evenings while an engineering group might produce only two bursts of activity: at the start of the day as files are opened and at the end of the day when they are closed.

The equipment you already have installed can play a role in choosing the right kind of data service, but that role should be minor, experts say. The cost of adding a new card to a router or buying a new Channel Service Unit/Data Service Unit (CSU/DSU, a modemlike device that converts output from your network

## WAN service options

- Private-line services, such as T-1 (1.544Mb per second) are well-suited for high volumes of data and applications that demand fast response time.
- Circuit-switched services, such as switched-56Kbps per second offerings, are good for intermittent data transfers.
- Packet-switched services, which include X.25 and Frame Relay offerings, are best for point-to-multipoint applications.

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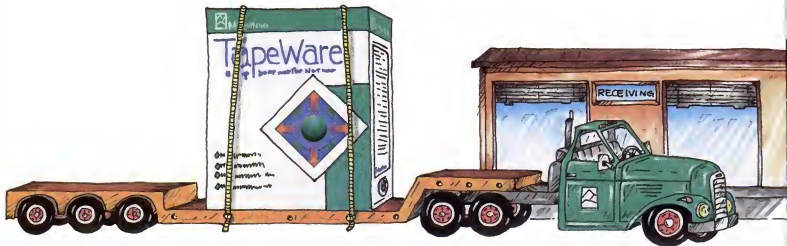
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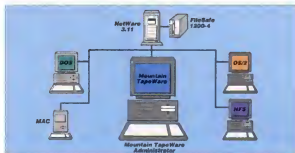
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## Introducing QEMM 7 The Memory Manager Worth Paying For

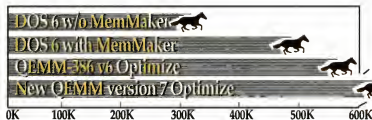
The newest version of the Quarterdeck Expanded Memory Manager (QEMM), version 7, once again is extremely innovative in using the critical area between 640K and 1024K. It finds space for more TSRs and drivers in this area than anyone thought possible. It optimizes this area, taking into account the many drivers that need more memory at start-up than when running; instantly calculating millions of possible memory configurations to find still more memory for your programs to use. And it treats the rest of memory as a giant pool to instantly fulfill the needs of all of your programs—whether they use extended or expanded memory. Whether your PC has 1 megabyte or 16, you can benefit from new QEMM 7.

### Instant Riches

What does more memory mean in a practical sense? It means that your DOS and MS Windows programs run faster, smoother and more reliably. It means you can continue to add valuable utilities, drivers, TSRs and new capabilities to your PC. Whether it's workhorse drivers like LAN utilities and fax drivers; productivity-enhancers like disk caches and disk compressors; or fun and exciting capabilities like sound boards, CD ROM drivers, graphics tablets, etc. The better your memory is managed, the more versatility and flexibility your PC has. QEMM 7 lets you have it all without fear of 'out of memory' messages or crashes.



# How to Look a Gift Horse in the Mouth



We tested DOS 6 with and without MemMaker and with QEMM 6 and our new QEMM 7 runs away from all of them. See details of test conditions listed below.

## DOS 6 Giveth, DOS 6 Taketh Away

The best feature of new DOS 6 is the stable of utilities it includes. Trouble is, they all eat up memory. DoubleSpace file compression needs 43K, Vsafe anti-virus needs 745K, Smartdrv disk cache needs 28K and even Undelete takes 10-14K as a resident program. Using Microsoft's free memory utility MemMaker, you could easily end up with a net loss of available 'conventional' memory in DOS 6.

New QEMM 7 takes the best of the new DOS 6 features into account, finding ways to give you more free memory for your program while taking full advantage of DOS 6. One new QEMM 7 feature, DOS-Up, moves the DOS 6 kernel, its data and resources to memory above 640K (this feature also works with DOS 3-5) freeing 770K. Another new QEMM 7 feature, Stealth DoubleSpace, frees 40K of the memory addresses used by DoubleSpace and makes them available for other drivers and TSRs. Both features ensure that the all-important memory below 640K is free for your programs. And QEMM 7's seemingly small feature of supporting DOS 6's multiple configurations gives you the flexibility and ease of setup that you expect. (MemMaker doesn't work well with this important DOS 6 feature.) That's why it makes more sense than ever to put your money on the best memory manager—QEMM.

## Page Frame: the Key to Your Future

There's been a lot of talk about our patent-pending Stealth technology. Jealous talk, mostly. Because nobody else can touch its performance. Our Stealth ROM feature, pioneered in QEMM 6, frees 48-15K of ROM addresses for use by TSRs and drivers. Our Stealth DoubleSpace feature, described above, frees another 40K. And as you might imagine, there's more to come.

The key to Stealth is its use of a 64K reserved area above 640K called the page frame. Besides being used by Stealth, the page frame is used by Lotus 1-2-3 r2x for larger spreadsheets and WordPerfect 5.x for larger documents, DESQview for multitasking, Novell Netware, IBM LAN Server and DECnet for reducing the network driver memory footprint, plus games like Wing Commander, Car and Driver, Ultima Underworld II, Wolfenstein and others for fast action. You sacrifice all this when you turn off the page frame

(which other memory managers do to maximize available memory above 640K). It's this use of the page frame by Stealth that lets you set up your PC with a mouse, CD ROM, sound board, a network such as Novell NetWare, reserve 8-24K of extra memory for optimal MS Windows performance, use all of DOS 6's memory-hungry utilities and still have more than 630K available for your programs. (Compared to DOS 6's 527K available in the same configuration, after using MemMaker).

## Easier to use for Novices, More Power for Experts, More Memory for Everyone

Our seventh-generation thoroughbred QEMM has improved ease-of-use, with Express Install and Help features. And for power users, Advanced Install and editable parameters and troubleshooting hints.

And QEMM 7 comes with Manifest, the award-winning memory analyzer—enhanced for more flexibility—from Pentium testing to laptop battery reporting; network analysis to editable configuration files.

The new and ever more exciting capabilities coming to your PC will all compete for memory with your favorite applications, TSRs and drivers. And that makes QEMM 7 the front runner in your efforts to get the best performance out of your PC today—and tomorrow.

There's lots more to QEMM 7:

- Tuned for MS Windows
- New ability to use Vidram inside MS Windows
- DPMI Host
- Pentium Support
- Laptop suspend/resume support
- PS/2 micro channel adapters
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Prior versions of QEMM won nearly every competition in sight, as well as remaining the #1 best-selling memory manager for 5 consecutive years.

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How we got the chart numbers: CPU—486; 70 ALU Power; Business VIDEA machine equipped with 16 meg of RAM and running MS-DOS 6. Comparisons were done using the following memory managers: QEMM 7, QEMM 6, MS-DOS 6, MemMaker. In addition to the driver (or drivers) required by each memory manager, the following drivers, DOS versions and programs were loaded by all computers in the QEMM 6/7 test: SETVER, DOS-HIGH FILES-20, FILES-11, STACKS-11, MSCN-NDOS, SNDRM-128S, SDC-128S, DOS-SHELL, SMARTDRV, the ACTOEMM.BAT file, VSAFE, MSDOS, UNDELETE.LSI, COM, SECDIR.COM, IPKOR.COM, NETX, OR FINNETX, MOUSE.COM, SMARTDRV.COM, PETSAPP.COM, ©1993 Quarterdeck Office Systems. Trademarks are property of their respective owners.

to the serial digital format used by the telephone company quickly pales in the face of line usage charges, which can run thousands of dollars per month.

**WHAT'S MY LINE?** Bandwidth requirements aside, the next big decision is whether to lease a private line or to use one of the switched data services available from the telephone companies. Private lines are just that — private digital "pipes" from one location to another. They are always available, and you can do anything you want with them, including mixing voice and data.

They are also expensive, typically costing a minimum of several hundred dollars per month depending on distance and speed. However, this cost is fixed, regardless of how much you use the line.

Yet private lines can be a good deal if you need to move large amounts of data between the same two points daily. LAN Systems Inc., for example, rents a "fractional T-1" line between its offices in San Diego and New York. A T-1 is a private digital line that runs at about 1.544Mb per second. They are frequently split between subscribers into slower speed "fractions" to lower the cost.

Private lines can be prohibitively expensive, however, when connecting LANs in several places or when your data needs are occasional and you won't be routing voice calls over the same wire. Although a two-site WAN can get by with one line, a five-site network will require a minimum of five lines — and that's using a ring topology, which means traffic has to be passed through other sites on the way to its destination.

Establishing direct connections between all sites in a five-site WAN would take ten private lines with each site connected by four lines to all the others.

If you've decided a private line isn't for you, you have your choice of two remaining alternatives: circuit-switched services, like those used for voice communications, and packet services. With each of these services comes a variety of options and transmission formats.

Switched lines are analogous to standard dial-up telephone lines, but for digital data. A connection can be made be-

tween any two locations served by telephone companies with switched digital services. They function in much the same way as a private line once the connection is established and are available in a wide range of speeds. They are often sold as "switched-56" or "switched-64" services.

Switched lines can be very cost-effective, especially when small or sporadic amounts of data are sent. According to materials supplied by AT&T, the cost to send a 1MB data file via switched-56 service is about 75 cents, compared with \$2.38 for a 19.2Kbps modem connection using standard dial-up service. At these prices, the company says, switched services are less expensive until the volume of data moved approaches 100MB per day.

Like private lines, however, switched lines are limited to point-to-point connections: This LAN dials that LAN. What do you do when your traffic flows between a number of sites?

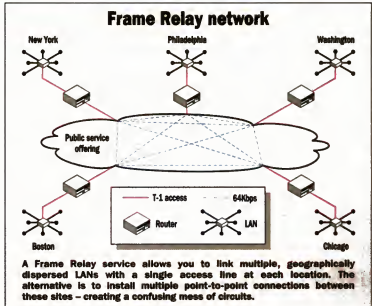
**PACKET SWITCHING.** You could use switched lines between all of your sites. However, that could get messy because each network would need a port for every other location.

Instead, a technology called packet switching is used. With this technique, you send your data to the phone company or value-added network (VAN) provider in small chunks (packets) that contain the network address of the recipient. The telephone company routes the packets to the appropriate destination.

Packet switching supports a one-to-many model of connectivity: a sender can use a single connection to send packets to many places. However, the way in which this is accomplished varies greatly.

Packet switching comes in a wide range of speeds and protocols. Although the protocols used over the telephone switching systems aren't important to your LAN, they are not interchangeable, which means you can't send something in one format and receive it in another. Packet-switching is used by X.25, Frame Relay, and Switched Multimegabit Data Service (SMDS) offerings.

Of course, there are some drawbacks. Assembling data into packets takes time



and, more importantly, adds overhead because each packet contains a destination address. X.25 service, based on the CCITT internal standard protocol of the same name, comprises the bulk of packet switching traffic today. X.25 service adds error correction, which further slows things down but increases the reliability of the transmission.

Newer packet services, such as Frame Relay and SMDS, remove the error checking, putting the onus on customers' applications and network equipment to maintain data integrity. Frame Relay and SMDS further differentiate themselves in their connection models: X.25 and Frame Relay are connection-oriented, while SMDS is connectionless. In the former, a virtual connection is established between the sender and the recipient so that all the packets from one place flow to the other until the connection is terminated.

SMDS, on the other hand, has no such constraints; each packet can contain a different address. SMDS is not widely available yet, although the local Bell operating companies are putting their collective weight behind this standard.

And there's one more drawback to packet-switching: It can't transmit voice communications.

The majority of traffic on private lines is voice, explains John Hudak, product manager for Frame Relay services at Bell Atlantic, in Arlington, Va. Packet-switching technologies deliver data in bursts, not in a constant stream, as is the case with voice and video calls.

**WE WANT YOU!** Once you pick the type of service that best suits your needs, you will have to sort through the hype from the local and long distance carriers about their services. They will do everything but call you at home during dinner to get your business.

Fortunately, this decision is relatively easy to make and carries no great penalty if you decide you've made a bad choice. Among the big telephone companies, business services are virtually identical — both in price and quality. In fact, a study by market research firm Business Research Group, in Newton, Mass., of long-distance company customers indicates that all have similar satisfaction — regardless of which company they use.

According to BRG vice president

Kevin O'Neill, what little differences remain are "rapidly evaporating" as all carriers move to fiber-optic cable for voice and data transmission.

Yet much work needs to be done, especially at the local level. The levels of service offered by local telephone companies can vary greatly, and some standards have either been only recently finalized or are nearing completion now. Many telephone company switches don't support a full range of digital services, and comprehensive management falls short in places.

**GETTING WIDED.** Connecting a wide area network takes more than protocols and standards; it takes hardware.

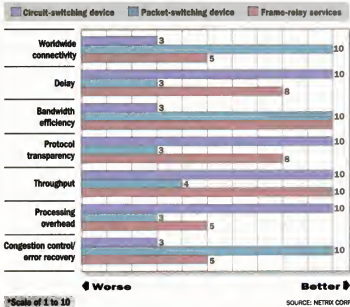
If you are simply hooking up one NetWare LAN to another and don't plan to run any protocols other than IPX, you can get by with just an Ethernet or Token Ring bridge at either end. Add more sites or protocols, however, and you will need a router.

Routers are more efficient at WAN tasks than bridges, says Dave Schrifgeiser, data networking director for AT&T. Because they do more than a bridge, they are also more complex to install and manage. Routers also tend to come with more management capabilities than bridges. They are also good at sending a large variety of packets to several destinations. If you already have a router, you can usually install interface cards appropriate for the WAN service you have chosen, such as a Frame Relay interface.

You will also need to buy a CSU/DSU for each site on the WAN. This device translates the parallel output of a bridge or router to a serial digital format compatible with that used in the carriers' networks. Check your router, though — many of the newer models incorporate CSU/DSUs.

**IT'S AN ADVENTURE.** Getting a wide area network working isn't the easiest job you will ever tackle, but it doesn't have to be impossible. Despite the pitfalls, reliable connections are available at reasonable prices, and you can get them if you are willing to do your homework. The wide variety of services mean you will find something that fits the bill, whether you need multiple-megabit speeds for the latest client/server application or just enough speed to send E-mail. □

## Rating WAN services\*





# ENTERPRISE COMPUTING / MANAGEMENT

## Re-engineering demands expert management

Project management tools will help you track complex operations and stay on budget

BY DEBORAH ASBRAND

Anyone who has ever managed a software-development project will tell you that the process is vulnerable to all kinds of threats: missed schedules, cost overruns, poor quality, user disenchantment, and cancellation.

With more companies undertaking massive re-engineering projects, managers are in the hot seat more than ever as they try to shoehorn the intricacies of software development into fixed timetables and cost parameters.

But project management doesn't have to be a nightmare. By arming project overseers with a combination of development tools and old-fashioned business know-how, companies can avoid black-hole projects that drain corporate coffers and waste years of staff time.

**BRAIN DRAIN.** A severe shortage of capable project managers is partially to blame for the increase in failed projects, says Jim Willbern, national director of KPMG Peat Marwick's runaway systems practice, in Dallas.

"While most companies recognize that it takes a lot of experience to pull off a project, they don't have that many people who can do the job," Willbern says.

But an equally large part of the problem is software's inherent flexibility. Developers have an infinite series of options when writing code and must explore as many options as possible before they hit on the one that works best. As a result, software development resists the predictability that companies want to impose on strategic and expensive development.

"The mechanisms and tools to do the measuring are lousy," says John D. Everette, a professor at the University of Minnesota's information and decision sciences department, in Minneapolis. "[And] human beings don't want to be measured because we fear it's going to make us look bad. Yet upper management needs to know how long a project will take and how much it will cost. So you throw out some numbers."

**A WHOLE NEW BALL GAME.** Project managers coordinating large software development efforts are stalked by a special set of challenges. For one thing, there's the



BERNARD FRANZOSKI

lack of standards. The tried-and-true development cycles that worked on mainframes don't translate to client/server architectures.

"The development tools are different, as are the skill sets of the people, the language they're working in, and the platform itself," says Arnie Finkelstein, a consultant with KPMG Peat Marwick. "You have to select a system development life cycle that's specific to the application you're building."

The familiar benchmark of lines of source code as a measurement of productivity is a thing of the past, too. Today, more software is being measured in function points, a system that calculates software characteristics such as input, output, number of logical files, and num-

ber of user inquiries. Businesses favor the function points over lines-of-code tallies because they allow end-users greater involvement in project development.

Commercial project management software provides some relief. There are approximately 70 project-planning programs and 50 software-estimating tools, according to Software Productivity Research Inc. (SPR), of Burlington, Mass. They offer a mixed bag of assistance. Lower end programs, priced at \$1,000 or less, offer little more than a collection of Project Evaluation and Review Technique (PERT) flow charts and Gantt time line charts — not much help to the project manager who must track schedules, milestones, resources, and costs.

More sophisticated programs take on

the chore of estimating project requirements. Although these programs aren't necessarily more accurate than manual computations, their quick recalculations can ease the project management process, says Capers Jones, SPR chairman.

**COMMON SENSE.** Of greater use to a software project manager are basic business skills. Consultants say that too few project managers possess even rudimentary management skills or understanding of business processes. A single course in software quality control can save a company hundreds of hours of debugging.

What's more, the typical programmer-to-project-manager career path doesn't necessarily produce top-flight project managers. So more companies are putting highly complex development projects in the hands of business generalists.

At Allstate Life Insurance in Northbrook, Ill., Ben Currier has managed staffs as large as 800 and overseen the consolidation of data-processing centers. In 1990 Allstate assigned Currier to shepherd a strategic information administrative system. He divided the 150 project members into small teams and assigned immediate goals. This allowed "everyone to feel a sense of ownership and responsibility, so there could be periodic successes," Currier says.

The payoff? A multimillion-dollar project that made it to the finish line. □

Deborah Asbrand is a Boston freelance writer specializing in PC software issues.

## How to avoid common project management pitfalls

Experts say these six steps can help you avoid some of the most common project management mistakes:

- Maintain a broad overview of your project in the early planning stages. Plans that are too detailed in the early phase can be as problematic as plans that are too general.
- Use a project life cycle that calls for planning to continue with each step of the project, thus accommodating changes and modifications that arise.
- Adopt project-planning and estimating tools. There is some sense taking on tasks that the computer can accomplish much more easily and ably.

• If an outside vendor is managing the project, require the consultant to provide regular progress reports, use project management software, a specific development life cycle, and a quality analysis process.

• Set up a user committee to see the project through. User input can be of tremendous assistance in managing the organizational change that must occur in order for a new application to be successfully adopted.

• Get some training. These days, the stakes are too high to allow untrained project managers to tackle complex development efforts. Plenty of training companies offer courses tailored to the needs of IS.



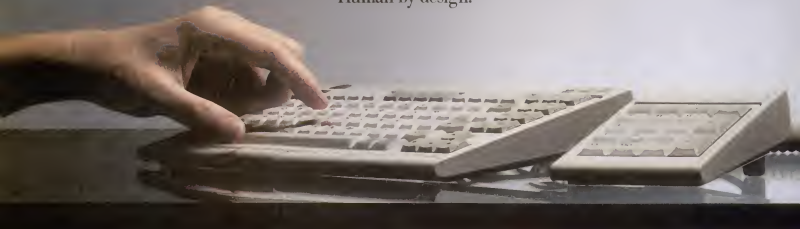
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## Case Study

# Project management puts jewelry maker on track

## Downsizing helps reduce the hardware and application maintenance requirements

BY ALICE LAPLANTE

If you think the personal computer industry moves fast, just take a look at the fashion world. Seasonal trends and overnight sensations mean that clothing manufacturers need to design, manufacture, and deliver new products to customers in short order. And computer technology should help, not hinder, this rapid concept-to-market requirement.

The 1928 Jewelry Co., an \$80 million manufacturer of fashion jewelry, found that information technology was more hindrance than help. The Burbank, Calif., firm faced a number of setbacks resulting from its inability to develop new business applications in a timely manner. The IS department lacked a coherent software development methodology and project management skills.

The situation could have quickly escalated to nightmarish proportions, but the adoption of PC project management software and a new application development philosophy arrested the problem.

Today, 1928 Jewelry has:

- eliminated its one-year application development backlog,
- resolved clashes between department managers claiming priority for pet technology projects,
- increased programmer productivity 25 percent,

reduced "progress report" meetings from 2 hours every other week to 45 minutes once a month, and

- brought 90 percent of all technology projects in on time and on budget.

Although project management software can't solve deep-seated management problems, a well-designed project management package can give managers the tools and organizational framework to bring about needed changes.

1928 Jewelry implemented MicroMan II, a \$2,895 project management package from POC-IT Management Services Inc. of Santa Monica, Calif. Based on 1928's experience, it is easy to see why this category of software is rapidly catching on in corporate IS departments.

**THE CORPORATE JEWELS.** A year and a half ago, 1928 Jewelry's 14-member IS department was struggling to support business and manufacturing operations. 1928 Jewelry manufactures 5,000 different fashion accessories for 7,000 customers worldwide. The applications backlog included more than 100 projects that were not only behind schedule but over budget as well.

The main problem? Priorities, says Erwin Bremermann, the IS manager hired to put the IS staff back on track.

"There was mass chaos resulting from the continuous juggling of projects," Bremermann recalls. "The head of manufacturing wanted one thing, the sales department wanted something else, and there was a constant state of confusion as to what was expected from the technology staff." Programmers were pulled off one project to work on others, yet there was no way to determine which project took precedence, he says.

Then something happened that caused management to see the need for dramati-



### Eliminating the 'fudge' factor in project management

**WHO:** Erwin Bremermann

**WHAT:** MIS director

**WHERE:** 1928 Jewelry Co., Burbank, Calif.

**PROBLEM:** An out-of-control application backlog and increasing user demands left the development staff in disarray.

**SOLUTION:** MicroMan II project management software and stringent development methodology cleaned up state between users and the IS department.

**MOST SURPRISING LESSON LEARNED:** If you use a good project management package correctly, there's no need for the "fudge" factor when estimating costs and delivery dates.

**QUOTE:** "Our programmers are no longer caught in arguments with managers about whose project has top priority. A good project management package helps clarify these issues and allows employees to concentrate on their work."

PHOTO BY BOB WATKINS

ic change. The company decided to enter two new markets and planned to service them with two new, separate divisions.

"To support these new markets, we needed separate commission structures, separate raw materials purchasing, and cost accounting functions, all of which meant additional systems work," Bremermann says.

The company was also becoming heavily involved in electronic data interchange, an electronic means for sending business forms such as purchase orders.

To support all of these new business demands, 1928 Jewelry decided to revamp the IS department.

Bremermann took two important steps: He replaced the Unisys 2200 mainframe running off-the-shelf and custom applications with an integrated Unix application environment. He also introduced the IS department to project management.

DataWorks System, from DataWorks Corp., in San Diego, was chosen as the application suite. It's a Pick-based manufacturing package that provides scheduling, work order, production, inventory, cycle count, and purchasing and receiving functions in one package. Pick is based

on the System V version of Unix.

The hardware platform is a Sequoia Series 400 symmetrical multiprocessing system from Sequoia Systems Inc., in Marlborough, Mass., combining Intel 486 and Motorola 68040 processors. Sequoia figures prominently in transaction processing environments such as manufacturing.

**FREEDING THE LOJAM.** Bremermann hoped that by moving to a new system, the IS staff would be freed from labor-intensive host maintenance and could focus on the application backlog.

Once that phase of the reorganization was under way, Bremermann began looking for a project management solution. He chose MicroMan II because of its follow-up capability.

"There are literally hundreds of project management packages out there, and most of them do a very good job of planning," Bremermann says. Where most applications fail is in follow-up, control, and performance monitoring, he says.

"You need to be careful that you don't drown your workers in the administrative [work]," he warns. "I want to eliminate, not create more, administrative work for my employees."

### Make the most of your time with a project manager

Project management software divides a project into logical phases, then subdivides them into activities and executable tasks.

Specific tasks are assigned to particular employees, and weekly report forms are given to each worker, which detail their tasks.

The simple act of breaking down the project components goes a long way toward taming an out-of-control development project. This process helps ensure that reality checks are routinely performed and managers sign off on work performed at established intervals.

The following is a five-phase project management model that many IS managers use when developing new systems.

- Planning:** The purpose and scope of the project is defined, and preliminary cost, personnel, and time requirements are estimated.

- Analysis:** A list of project requirements is compiled. Users are interviewed about their needs, and IS professionals are consulted about appropriate technologies.

- Design:** A thorough plan is written, detailing specific technologies, features, and application functions.

- Construction:** Application programming and testing begin.

- Implementation:** Applications are installed, and users are trained.

One of the biggest benefits of using a project management methodology is that clashes between the IS department and business line managers have been virtually eliminated.

Project requests are submitted by the users. Preliminary cost and time estimates are developed by IS and entered into the MicroMan log as "planned projects," Bremermann says.

Once a month the IS strategic planning committee, which includes business and IS managers, meets to review the IS workload. All "active" projects are discussed using progress reports automatically generated by MicroMan. Upcoming projects are also discussed, and priorities are assigned.

MicroMan also allows Bremermann to track ongoing maintenance activities, which now account for only 35 percent of the IS staff's time, compared with 65 percent under the old system. Programmer productivity has increased as well, and disputes between department heads are a thing of the past. □

Alice LaPlante, InfoWorld contributing editor, can be reached at (415) 312-0704 or [alice\\_laplane@infoworld.com](mailto:alice_laplane@infoworld.com).

Down to the Wire / Nicholas Petreley, Nancy Durester, Laura Wonnacott

## Benchmark test serves up Secondhand Tomatoes and Argyle Toast

We've been running Artel's StarBridge Turbo on our production network for several weeks now. In case you haven't been following along, here's roughly how it works: We have a handful of NetWare servers tied together through the Artel bridge. We have a number of concentrators plugged into the bridge, as well. One of the fifth floor needs to access Server Three, for example, his workstation talks to a concentrator, which talks to the bridge, which passes the message to Server Three without bothering any other server.

We're also benchmarking the Kalpana EtherSwitch, an Ethernet LAN switch that sorts out network traffic in much the same way as the Artel bridge—with one important difference. The Artel bridge checks the integrity of each network packet and forwards only the good ones. The Kalpana, on the other hand, is an equal opportunity deployer—it only checks the integrity of a packet when it does not recognize the Ethernet address. Otherwise, it just passes along whatever it gets.

**YOU BET YOUR SWEET AMOEBA.** We wanted to test and compare the two products for our tests, so we used a FoxPro database transaction processing order entry benchmark.

Incidentally, we insist on using realistic customer names, part names, and the like in our database tables. No random alpha-numeric characters. The use of realistic data can skew a benchmark. So we built a data generator that randomly selects unique combinations of words to create realistic part names. Well, maybe not truly realistic, but we get some interesting combinations for part descriptions like "Secondhand Tomatoes," "Argyle Toast," and "Sweet Amoeba." Despite all ef-



forts, we couldn't get our program to randomly generate Teenage Mutant Ninja Turtles. It takes a human sicko to come up with a combination like that.

Anyway, the Kalpana switch was on and we were ready to benchmark. The first benchmark had six workstations and two servers connected to the switch. The switch's job is to sort out conversations between the six workstations and the two servers on our network.

Normally, that kind of load would barely tax the switch at all, but we tuned the benchmark to emulate far more stations than we really had. We even figured out a way to tune one portion of the benchmark to present an unrealistically heavy load to see how the switch would hold up under the strain. We ran a network-intensive program on five workstations for network-wise, and we added the transaction data on the sixth. This would be the equivalent of trying to concentrate on your work in a roomful of hyperactive toddlers.

It worked great. We had so many Ethernet packets smacking into each other on the wire that the collision lights on the concentrators never went off. Like we

said—it was unrealistic, but it might tell us something about the products.

It sure did. Some of the database indexes were corrupt. It figures—you always get corruption when you tax too heavily. We ran it again. The database indexes were fine. We ran it several more times and found that the files were corrupt only on the first time. We ran the import with a typical network load, and the corruption never occurred.

We pulled the Kalpana switch out of the picture and rewired the lab network servers using a simple coaxial backbone. Same results. We got corrupt files about half the time. That left Kalpana off the hook, but we were still stumped as to why this data corruption occurred.

**CYCLOC REDUNDANCY AGAIN.** We had to put the corruption problem on hold for the moment. As far as we were concerned, we had legitimate numbers for the Kalpana bus.

We turned our attention back to the production network. It was time for a switch. Literally. We yanked the Artel bridge out of the computer room and plugged the EtherSwitch in its place.

The exchange couldn't have been easier. The only snag was the side-effect of the fact that we had ironed out the configuration wrinkles when we converted our production network to the Artel bridge. We would have run into the same problems we had with Artel if we had started with Kalpana.

We yanked the Artel bridge to our test bed and ran our megabenchmark. As we expected, the bridge ran a little slower than the Kalpana EtherSwitch because the bridge checks each packet before it sends it on its merry way. We checked the imported index data. It was fine. We ran the test again. And again. And again. The data was fine every time.

We bounced around different theories about the data corruption and currents lack thereof. There was the obvious difference—the Artel bridge did integrity checking on network packets. But while we could see that the Artel would reduce the need for IPX to check packet data integrity, IPX should still take care of any bad packets that get through, right? We bounced it off Jolly Rodney Gailie, one of our network gurus. He pointed out that, in fact, Novell's IPX protocol does not use the cyclic redundancy check (CRC) checksum field in an IPX packet. IPX just sets the checksum field to the bogus hexadecimal number 0xFFFF, and ignores it. Depending on where a frame gets misaligned or otherwise corrupted, IPX sometimes mistakenly assumes the data is good.

That limitation, by the way, puts Novell in a tight spot. They can't rewrite IPX to examine the CRC in an 802.3 Ethernet packet. Networks would fracture, and apart from the moment those phy 0xFFFF checksums started piling up.

So the word is, NetWare 4.0 IPX drivers will only use the checksum field if you use Ethernet 802.2 frames, thus avoiding any clashes with the 0xFFFF checksum that will still exist in 802.3 packets. We'll check into this further and give you the scoop in an upcoming column.

Meanwhile, we're impressed with the unexpected protection we got from using the Artel StarBridge Turbo. It gives us a sense of comfort knowing we can order our Argyle Toast without fear of data corruption.

*Down to the Wire chronicles the ongoing adventures and misadventures of our InfoWorld IS task force, the Enterprise Team. E-mail can be sent via the internet to nicholas\_petreley@infoworld.com.*



Help Desk / Brett Glass

## DOS documentation and EISA devices are hard to come by

Q We just bought several copies of Microsoft Corp.'s DOS 6.0 upgrade and have discovered that the users' guide does not contain all the commands and what they do. The index says simply "See MS-DOS Help."

Elena Vargas

A Actually, in the documentation there is a short list of DOS commands, but it does not give a good listing of details. A good explanation of the commands you may be accustomed to. The index directs you to DOS 6.0's on-line help system, which you can access by entering HELP at the DOS prompt. But if you want a real, printed manual, you will have to pay extra; it comes as part of the \$19.95 DOS 6.0 Resource Kit. To order it by phone, call Microsoft at (800) 422-9400.

Q Two months ago we bought an EISA machine for our small business and hoped to find some EISA peripherals and boards to put into it. We were able to find an EISA disk controller, but everything else is still ISA. We are having a

hard time identifying sources for EISA products. We have not found any advertisers in *InfoWorld*, and there seem to be few in other publications. Where can we find EISA add-ons?

Randy Brinson

A It's a shame that EISA peripherals aren't readily available because EISA is a far more stable and time-tested standard than the VESA Local Bus standard. (I've even found that some motherboards

perform disk I/O more quickly with a bus-mastering EISA SCSI host adapter than with a VLB host adapter.) Unfortunately, most manufacturers haven't realized that there are many consumers who bought EISA machines and are itching to upgrade for better performance. So EISA video controllers and network cards—two other types of adapters that can benefit from EISA—are usually special-order items. *InfoWorld* reviewed several EISA network cards in the April 19 issue. As for video cards, my main workplace machine, which I assembled just before local bus machines became available, runs like lightning with the EISA version of Apogee's Renegade Windows accelerator. And this is without

bus mastering. If Apogee produces a card that can work as an EISA bus master, it could quadruple the rate at which data flows from main RAM to the screen.

Q I have an IBM 486SX laptop with an AIX/XTX graphics adaptor. The adaptor has a Quantum 105S (105MB) SCSI drive that works with DOS, but OS/2 2.x will not recognize the drive. Why?

Orin Rehorst

A The Aixnix extends the laptop's internal data bus so you can plug in ISA peripheral cards. Aixnix does not sell it with a hard drive installed, so the drive must have been added by you or by a dealer. To get the hard drive working with OS/2 2.x, you will need to open the device's Action menu and find the name of the manufacturer of the SCSI host adapter card inside. Armed with that information, you can call that manufacturer and obtain software drivers for OS/2 2.x.

Q Our FoxPro 2.0 database applications are having problems when sending information to a network printer. When we attempt to print reports, they do not ac-

tually print until we exit the application. Is there anything we can do to force the report to be printed immediately?

Leo Rosenhand

A This problem arises because FoxPro 2.0 attempts to send the report to the printer spooler from printing, until it exits. One way to get around this problem is to issue a SET PRINTER TO command, which will close and re-open the printer. (Warning: this trick works in FoxPro, but not in FoxBase++) Article Q9868 of Microsoft Knowledge Base names several different methods of printing; an assembly language (.BIN) routine that calls a DOS networking function. However, because there appears to be a serious bug in Microsoft's code (it does not set all the CPU registers properly before the call), I recommend the SET PRINTER TO command instead.

*Brett Glass' Help Desk answers readers' business computing questions. Brett can answer questions personally. Readers can ask questions by calling (800) 227-8365, Ext. 702, or by e-mailing him at CompSolve (72267.3673) on the internet at brett.glass@infoworld.com.*





## Civilized Computing / Cheryl Currid

# Here are a few Toys for Techies that are fun all year round

It's beginning to look a lot like Christmas. Whoa, has Currid melted down in the summer heat wave or pushed the fast forward button on her time machine?

No, I've decided to have a little fun this summer and launch another series of my Toys for Techies columns. Regular readers of this space know that I generally reserve several columns in December to write about a Christmas shopping list of my favorite new technology.

Currid's Christmas-themed list is reserved for fun-but-useful computing gizmos and gadgets. The purpose of my Toys for Techies series is threefold: first, to introduce fun but useful technology that corporate IS people might otherwise ignore in the realm of everyday business; second, to open the minds of readers about what technology is swirling around and how it can be applied; and third, to empty out the last remaining dollars from IS budgets before they evaporate on the balance sheet. (The third objective of my program has seen many a negative letter from the range type.)

Now, for the summertime sequel. So, what's hot? Plenty — especially in the emerging area of multimedia. I know, I know, many of you may think multimedia is sexy but is often a technology in search of a mission. It's not really seri-

ous technology. Multimedia is pricey, right?

Well, there are low-cost ways to dabble in the "lights, camera, action" world. Moreover, once you bring in a few products, I bet you'll find plenty of fifty uses that will help your business.

Try out the FlexCam video camera from Video Labs Inc. of Minneapolis. This camera wins the "cute" award. The \$599 FlexCam is the size of a half dollar;

for the office cleaning crew.

Remember "Candid Camera"?

From a business benefit side, this is a low-cost, low-risk way to try out video capture for your company. How about turning out a personnel database that includes a color picture of each employee? That would be a great tool for the front desk receptionist or guard — or, for that matter, a CEO who makes a practice of visiting a plant or out-of-town office. No

for prototyping or rapid development. You don't have to make a major commitment to purchase one for every man, woman, and child in the company, but it's a good idea to bring in a couple of licenses and give programmers a chance to work (or play) with them.

And, speaking of retaining Cobol programmers, consider building a library of video-based training courses. Learn-Key Systems, from Ogden, Utah, has a video training course for just about every software title known to man. These low-priced videos (ranging from about \$69.00 to \$149.00) feature some prominent instructors and authors teaching the ins and outs of many software packages.

Be sure to try out CD-ROM training tools, too. Learn-Key, like other video training companies, is also experimenting with CD-ROM-based instruction training. The student can skip around on various topics on the CD-ROM and doesn't have to sit through sequentially presented material.

OK, we've got a video camera, a database, and a set of training tapes under our tree. Stack them neatly because there are plenty more toys to come. Tune in next week.

*Cheryl Currid, president of Houston-based Currid & Co., focuses on helping clients assess, apply, and organize for new information technology. Her Curriculum address is: 75300,2660.*

## The \$599 FlexCam is the size of a half dollar; it is mounted on a flexible, goose-neck pedestal. . . How about turning out a personnel database that includes a color picture of each employee?

it is mounted on a flexible, goose-neck pedestal that sits unobtrusively anywhere on your desk.

It doesn't look like a conventional camera, so it doesn't scare people into thinking they are being watched.

FlexCam's picture quality is excellent even in a standard office environment with overhead lighting. We set it up in our offices and left it on one evening, making it quite a topic of conversation

more fumbling through confusing introductions.

Next is a perfect item for all those Cobol programmers trying to update their skills. Check out Microsoft Corp.'s Access, Borland International Inc.'s Paradox for Windows, or Software Publishing Corp.'s Superbase. All of these products qualify as great learning tools for Cobol programmers to test the waters of GUI development. You can use them



## The Network Curmudgeon / David Strom

# The new 32-bit operating systems aren't all fun and games

With all the hype over the new 32-bit operating systems, I decided to take the plunge and really see how they work over my network. So I put together a test machine, got copies of the various OSes, and went to work. That was about two months ago. What a long, strange trip it's been.

I tried to use actual shipping versions of each OS: the four that I picked were Windows NT (of which I still have a beta), OS/2 2.1 (also a beta but supposedly will be shipping by the time you read this), UnixWare, and NetWare 4.0 (these last two are shipping copies). Each comes on a CD, which is intellectually appealing and also poses a challenge in getting them running. (If you feel your currently operating system has been left out of this test, send a CD and I'll try to get it running, too.)

I have a relatively modest testing environment: a lab, a trio of Windows/Macintosh/NetWare 3.11 machines that I use both for "production" (research and writing) and for testing products for my clients.

I wanted to understand where each operating system stands (especially in terms of networking capabilities), who should or shouldn't use them, and whether I would select any of them over the OS currently installed on the three machines. (I guess the Mac will be fairly secure for the time being, as none of these operating systems runs on it. Plus, I am relatively happy with System 7 myself.)

I wanted to test how good a network client (and server) each product could be. By that I mean how easy it is to set up each OS to talk to my NetWare 3.11 server (as a client) and how easy it is to set up each OS as a server to run TCP/IP so that I could connect to it from my Mac and PC. A third criterion was how easily I could run my existing Windows 3.1 applications — at least for OS/2, NT, and UnixWare, which offer such a possibility. For NetWare 4.0, I took a look at its

components: The network adapter and the SCSI host adapter. This is where the story starts to get interesting.

Originally, I had chosen an Intel Ethernet adapter and an Adaptec SCSI host card. Both cards seemed to be mentioned on just about every machine's list of supported adapters.

However, neither adapter lasted very long in my test machine. The list of supported adapters for the NT NetWare client is woefully small: the Novell-Eagle

Next, understand your connectivity options — and what products you will need to make everything talk to one another — completely. For example, TCP/IP connectivity requires separate OS/2 and personal UnixWare products, but TCP is built into NT, NetWare, and the UnixWare Server edition. Macintosh client software for NetWare 4.0 was not available when I started this project, but they should be shipping now.

Third, running Windows with these advanced systems will be an interesting exercise in finding subtle problems and testing things carefully. Using the NetWare 4.0 Windows client, I found one product (Castell's fax and print server package) that wouldn't install with it running. I had to go back to my NetWare 3.11 client to get it installed.

One final thought: If you would like to read more on each of these new OSes, I highly recommend you pick up a copy of *Open Systems Today*. The entire issue is devoted to these new operating systems (with the exception of NetWare 4 and with the inclusion of NextStep, SCO's Open Desktop, and Solaris). You'll find good comparisons of the number of network cards supported and how each works as a client and a server, all written by people who have used various flavors of Unix for many years.

So, have I got all four running? Not yet. More on that in a future column.

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## Running Windows with these systems will be an interesting exercise in finding subtle problems and testing things carefully. Using the NetWare 4.0 Windows client, I found one product that wouldn't install with it running.

Windows client.

Finally, I also set myself a goal of getting all four installed and running on the same PC. For this test setup, I went with products from big-name vendors: a Compaq ProLinea 486 with 32MB of RAM, an NEC CD-ROM drive, and an HP SCSI 1-gigabyte hard disk. I wanted to make sure that all the OSes would run with this gear, so I took the time to go through all the various README files and configuration memos that I could get my hands on.

Notice that I have left out two critical

NE series of Ethernet cards and two 3Com cards.

I do out with Intel and in with Novell. I had to replace the Adaptec card with one from Future Domain after I tried to not to avoid to get my big HP disk divided into several partitions (one for UnixWare and others for DOS, NetWare, OS/2, and NT).

I learned several things. First, make sure you assemble your gear before you do the install. NT has a nice auto-detect feature, which is great if you don't change anything around after you install it.

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## REVIEWS / PRODUCT ANALYSIS

# Pentium servers and desktop PCs

These systems can provide you with breakthrough performance, but not in all situations



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**W**ith the advent of Pentium—Intel Corp.'s next-generation x86-compatible processor—we found ourselves asking the same questions you probably have asked yourself. Why would you want to purchase a Pentium system? Does it pay to buy it now or is it better to wait until after the hoopla dies down and prices drop to mass-market levels?

Because there seem to be more questions than answers about the Pentium, we have deviated from the norm in this roundup and tested beta systems.

This product analysis features four of the very first Pentium-based machines—two desktop computers, Compaq Computer Corp.'s Deskpro 5/66M and Unisys Corp.'s PW2 Advantage Plus 5606, and two servers, Advanced Logic Research Inc.'s ProVeis V and Hewlett-Packard Co.'s NetServer 560 LM.

We tested the mettle of this new chip and offer some insights into what Pen-

tium will—and won't—do for you.

**EVOLUTIONARY, NOT REVOLUTIONARY.** Because it is, by necessity, downward-compatible with older x86-family processors, Pentium is evolutionary, not revolutionary. It runs all the same programs as 486 systems, and there may not be a noticeable speed improvement unless the CPU is the bottleneck in your system and programs are recompiled to take advantage of Pentium's special features.

Our tests running the same program in both 32-bit and Pentium-optimized versions showed just a 3 percent performance increase when run on a Pentium desktop PC.

Although no machine seems fast enough when you're waiting for an answer to an important problem, the culprit isn't always a slow CPU. Now that local bus graphics accelerators have begun to address Windows' screen bandwidth requirements, it is the disk storage system that is often the most serious bottleneck in both workstations and servers. And if a workstation is on a LAN, the speed limitations of Ethernet or (especially) ARC-net are likely to be more important.

Thus, Pentium initially will find its niche in busy database servers, file servers, CAD workstations, and computers used for heavy number-crunching applications. Limited initial quantities of the chips will motivate manufacturers to maximize profits by building the chips into high-end servers. If history is any indicator, it will be at least two years, perhaps more, before Pentium processors

trickle down into aggressively priced mainstream machines.

**WHY PENTIUM?** The 486DX, and particularly its faster cousin, the 486DX2, prove fast enough for most users, especially those who run character-based applications. But if you are running Windows (or plan to use NT when it ships), even a 66-MHz 486DX2 will run up against the fundamental limits of a 32-bit bus; an idiosyncratic, complex instruction set; and a single pipeline.

The Pentium's 3.1 million transistors, packed onto a chip that is smaller than a quarter, are used to break these bottlenecks. How? The most important difference is superscalar architecture, which allows computers to accept more than one instruction simultaneously.

To understand how a superscalar architecture works, imagine that you run car wash and want to wash more cars per minute than you do currently. You could make your existing line run faster, and that would work up to a point. If the car wash ran too fast, however, cars would careen in and out at high speeds, creating a dangerous situation.

The answer: Build a second car wash next to the first one and split the vehicles between the two lines. Also, if you only occasionally washed larger vehicles, you could save money by dedicating one of the lines to handling just those vehicles.

This is essentially what the Pentium (as well as other state-of-the-art chips) does. As the Pentium architecture diagram on page 61 shows, the processor routes in-

coming instructions to one of two areas on the chip called pipelines.

These pipelines, called the U pipe and the V pipe, act as an assembly line that carries out Pentium instructions. Both pipelines can work on simple integer instructions, but only the U pipe can handle the processor's full repertoire.

Because both pipelines can't do everything, vendors must specially design compilers to get the most from the Pentium. Instruction sequences must be carefully crafted so that there is always something for each one to do. Also, because the V pipe can't execute 32-bit instructions unless the processor is in protected mode, peak 32-bit performance requires a DOS extender or a 32-bit operating system.

Finally, it is worth noting that many of the current crop of RISC chips, including several varieties of Sparc processors and DEC's Alpha, already sport superscalar architecture. Intel could not hope to keep up without offering similar features.

**64-BIT SUPERHIGHWAY.** If you were to add a second line to your car wash, you would probably need larger driveways to help the cars flow in and out smoothly. Pentium has a similar problem. In order to support the execution of so many instructions, it needs a wider path to memory. The Pentium's 64-bit data path acts as a 64-bit superhighway (twice as wide as the 486's data path). Pentium needs this feature to compete with RISC chips such as DEC's Alpha and MIPS Computer Systems Inc.'s R4000, both of which have had 64-bit data paths for some time.



If you were expanding a car wash, you would also be sure to enlarge the areas where customers drop off and pick up their vehicles. Pentium, like other new processors, does something similar by offering 16KB of cache (twice as much as the 486). Because Pentium, unlike RISC chips, has very few internal registers, the cache is even more important to performance than it is on other processors. Following the industry trend, Pentium provides the cache into two areas, one for instructions and one for data.

Pentium's floating-point unit (FPU), unlike the 486's, contains hardware adder, multiplier, and divider units, and it is designed to accept a new instruction on every clock cycle. Although the 486's coprocessors on chips designed specifically for floating point, Pentium's FPU is likely to be more than twice as fast as the 486's.

**BRANCH PREDICTION.** When the 486 microprocessor makes a decision that results in a jump to a different part of your program, there is often a delay as it gathers the instructions from the new area of memory. Pentium seeks to avoid this with a Branch Target Buffer (BTB). The BTB predicts the results of decision-making instructions, called branch instructions, and if it is correct, a jump will occur, prefetching instructions from the new location.

Unlike the 486DX2, Pentium (which will initially come in 60- and 66-MHz versions) runs at the full clock speed both internally and externally.

**ALIGNMENT.** If you think of data and instruction caches as doors, and data as a board that must pass through the door on its way into the processor, it becomes clear that data alignment is important. Imagine a bit of data as a board exactly the width of a door, only it's misaligned so the board is half in the doorway and half overlapping the doorway.

The processor must do the equivalent of sawing the board at the doorway so that the first piece of wood comes through the door, moving the sawed-off part so it is aligned with the door, and then bringing that section piece in. That's two fetches that the processor makes, in addition to the time it takes to saw the data and realign.

Pentium's architecture minimizes the problems with code fetches by making the code cache door movable. If an in-

struction jump moves you to the far side of the door and the instruction is large enough to overlap the doorway, Pentium can move the door a bit.

On data fetches, compilers can eliminate the time spent for the extra fetch, sawing, and realigning by keeping the boards lined up with the doorjamb. For the Pentium processor, alignment provides a significant performance boost because it does not require as many cycles than with earlier Intel chips. This gives the Pentium a larger percentage of time to devote to memory fetches.

**486 NOT OBSOLETE.** Will Pentium systems make the 486 obsolete, or will Pentiums be designed for specific applications only? Again, history can provide us with the answer.

The 486DX supplanted the 386 as the chip of choice only when Advanced Micro Devices Inc., Cyrix Corp., and Chips & Technologies created price pressure by creating 386 work-alikes. Likewise, Pentium prices will be too high for the volume market until competitors produce cheaper equivalents to the 486DX2 (a product which is sort of a half-generation ahead of the 486). This may occur within the next two to three years, with AMD only now preparing to produce 486DX chips.

Although the Pentium processor stands head and shoulders above previous generations of RISC and CISC processors, it is not as powerful as today's best RISC chips. (Even Intel's iCOM benchmarks show its chip to be about half as fast at floating-point operations as DEC's Alpha.) Pentium's biggest advantage over Alpha and other next-generation processors will continue to be compatibility with the existing base of PC-compatible software, an edge that may erode as the industry moves toward more portable operating systems.

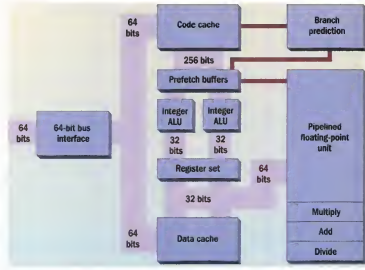
**RISC-V BUSINESS.** Pentium shares many features with RISC processors and the latest generation of Sparc chip sets. Superscalar architectures, uncommon in CISC chips, first appeared in RISC processors. Large on-chip caches and write buffers are also common to state-of-the-art RISCs. When executing "simple" instructions (where memory loads and stores arithmetic operations on internal registers), the Pentium works very much like a RISC chip. (It is no coincidence that the best optimizing compilers de-

signed to take full advantage of Pentium's 64-bit processing technology. However, the Unisys 5606, although balanced to utilize the Pentium's architecture, uses a 32-bit data path between the processor card and the system memory.

What users want to know is how much faster are systems running Pentium over Intel's 486 processor family. Our results, in general, show that Pentium-based computers running current business applications don't provide a huge increase in performance. However, when we ran a Pentium-optimized application on one of the Pentium desktop systems, we found a significant performance enhancement over the same program run on a 66-MHz 486DX2 PC. (See sidebar, page 65.) We also found that even on the 486-based system the same program performed faster on the Pentium.

**SERVERS.** Running our InfoMark net-

## Intel Pentium superscalar microprocessor



signed for Pentium will use RISC compiler techniques and favor these instructions. We were able to get our hands on a Pentium-optimized application — Pinar's Testystry, which uses a lot of floating-point calculations — and tested the application in both its 32- and optimized 64-bit incarnations on 66-MHz 486DX2 and Pentium desktops. (See sidebar, page 65.)

We were able to get our hands on a Pentium-optimized application — Pinar's Testystry, which uses a lot of floating-point calculations — and tested the application in both its 32- and optimized 64-bit incarnations on 66-MHz 486DX2 and Pentium desktops. (See sidebar, page 65.) Pentium does not share all the characteristics of RISC, however. Pentium instructions can range from one to several bytes, while RISC instructions are generally all of one size. Likewise, Pentium must deal with complex instructions that perform operations directly on memory operands; this isn't a necessity for RISC chips. Another key difference is that RISC processors generally have large numbers of internal registers — a feature that allows most computations to be done without accessing memory. However, the Pentium, because it is a direct descendent of Intel's 8088, has a small number of in-

ternal registers — a characteristic that gives compilers fits and inevitably slows down certain calculations.

Like some other advanced microprocessors, Pentium adds another reliability-enhancing feature — built-in parity checking on addresses and data. There is only one parity bit for all 64 bits of the address, but there is one for each byte of the 64-bit data path.

**WHICH OS FOR PENTIUM?** Industry watchers predict that new chips such as Pentium will clear the way for new system software, such as OS/2.1, Windows NT, and new flavors of Unix (e.g., Solaris and NextStep). To say the Pentium spurred the move to new operating systems and environments, however, is to put the cart before the horse. An enterprise's OS decisions are, and always will be, based on the application software it must run.

Whether a company moves to RISC, and whether it uses OS/2, NT, or NextStep, DOS, will depend on what is available and whether it feels the need to change.

Many organizations work quite well with character-based MS-DOS software. For these companies, even installing

See PENTIUM, page 64

## Executive summary

In this product analysis, we tested two servers and two desktop computers incorporating Intel's next-generation Pentium processor. Although we used the benchmarks and evaluation criteria specific to these classes of computers, we did not assign either category Powers or final scores to these units we reviewed were not shipping products.

One of the systems, the ALR ProVeia V server, is not a fully optimized Pentium machine but instead an upgrade module for both the ProVeia and PowerPro families of file servers. The other three machines — the Compaq Deskpro 566M, the Hewlett-Packard NetServer 560 LM, and the Unisys PW2 Advantage Plus 5606 —

work test suite on 35 clients, the HP NetServer LM was 3.5 percent faster than the ALR ProVeia V (both use 60-MHz Pentium CPUs). And the HP Pentium server was also 7 percent faster than its 66-MHz 486DX2 sibling. The HP Vectra 486/66, ALR's 66-MHz server, the ProVeia VM4/66d, was negligibly faster than the Pentium version — less than 1 percent.

When compared with the fastest 486DX2/66 file server — the AST Premium SE 466d — from our January 25 comparison (see page 58), both the HP NetServer 560 LM and ALR ProVeia V posted slower results, by less than 1 percent and 4 percent, respectively. The HP and ALR servers were, however, faster than the slowest 486DX2/66 server from that comparison, the HP Vectra 486/66ST, by 3 and 7 percent, respectively.

**DESKTOPS.** The Unisys PW2 Advantage Plus 5606 proved a bit slower (4 percent) than the Compaq Deskpro 566M. Com-

pared with the file servers we tested, the Pentium desktops yielded more pronounced performance improvements over their 486DX2/66 brethren. The Pentium-based Compaq Deskpro 566M was 46 percent faster than the desktop 466i. The Unisys didn't show as great an improvement as the Compaq; however, the 5606 was 25 percent faster than the PW2 Advantage Plus 4666.

The margin of difference for speed narrowed when we compared the fastest 486DX2/66 system from November 16, 1992, comparison (see page 114), the Tangent M466EX, against both the Compaq and Unisys machines. The Compaq Deskpro 566M and Unisys PW2 Advantage Plus 5606 were 11 and 6 percent faster, respectively. Against the average 66-MHz 486DX2 from that same comparison, the Deskpro and PW2 Advantage Plus were 37 and 32 percent faster, respectively.



## PRODUCT ANALYSIS

## Pentium desktops

	Compaq Deskpro 5/66M	Unisys PW2 Advantage Plus 5606
<b>SYSmark92</b>	201.60; 66-MHz Pentium processor.	193.86; 60-MHz Pentium processor.
<b>Compatibility</b>	No problems encountered.	No problems encountered.
<b>Expandability</b>	Two drive bays and four slots open after configuration; 144MB of 32-bit system RAM.	Three drive bays and five slots open after configuration; 192MB of 32-bit system RAM.
<b>Documentation</b>	Preliminary users' guide; comprehensive, easy to read; table of contents, glossary, index; additional manuals included for memory configuration and installation, etc.; complete Windows 3.1, DOS 5.0 manuals; quick-start card.	No manuals provided.
<b>Setup</b>	ROM-based setup with EISA configuration utility on disk, including on-line help; option for automatic configuration when changes are made; useful swappable drive configuration setting; capability to change video modes, COM ports, parallel port, and audio setups.	ROM-based setup with EISA configuration utility on disk, which includes on-line help; system automatically recognizes newly added EISA cards, leaving user to only install .CFG file supplied by vendor or one included with system; air directional cover for cooling CPU sits over one slot, making it unusable.
<b>System design</b>	Small-footprint case; CPU on card that plugs into motherboard; processor module contains four SIMM sockets; place for cache modules; well-designed combination heat sink and fan mounted above CPU for cooling; LEDs for power, hard drive; patches on motherboard.	Small-footprint case; built-in ATI mach32 Super VGA; built-in IDE and SCSI-2 controllers; built-in UPS connector; SIMM sockets easily accessible; fan and air directional cover blows air directly across CPU for cooling; LEDs for power, hard drive; patches on motherboard.
<b>Support policies</b>	Three-year warranty; free on-site service; toll-free line; BBS, fax support; extended hours.	One-year warranty; toll-free line; BBS support; extended hours.
<b>Price</b>	<b>\$6,999</b> estimated selling price for our configuration; will be sold through dealer channels.	<b>\$8,088</b> list price for our configuration; will be sold through dealer channels and direct sales.



**Company:** Compaq, in Houston, can be reached at (800) 345-1518 or (713) 370-0670.

**Test configuration:** Compaq motherboard; enhanced keyboard; Compaq EISA Qvision/1280E Super VGA with 2MB of VRAM; 510MB hard drive with IDE 1:1 controller; 3½-inch floppy drive; DOS 6.0, Windows 3.1; two 256KB secondary caches optional on system board; 16MB of 70-nanosecond RAM.



**Company:** Unisys, based in Blue Bell, Pa., can be reached at (800) 448-1424; fax: (215) 986-6850.

**Test configuration:** Unisys motherboard; enhanced keyboard; built-in ATI mach32 Super VGA; 1.1-gigabyte Seagate hard disk with SCSI 1:1 controller; 3½-inch floppy drive; 16MB of 70-nanosecond RAM.

## TEST PENTIUM SYSTEMS

In this product analysis, we evaluated both servers and desktops incorporating Intel Corp.'s Pentium processor.

Breaking with tradition, the computers we reviewed are not production, shipping units but beta systems. Because of this, we didn't score the individual categories (e.g., speed, expandability, etc.) or assign final scores.

We evaluated these servers and desktop computers according to the criteria and testing methodology specific to each hardware class (which we explain below). We ran SYSmark92 (but not the multi-tasking suite) on desktop systems and the InfoMark benchmark, which is a modified version of SYSmark92, on the servers.

### PERFORMANCE:

**Speed — InfoMark (server):** This suite is designed to simulate actual users on a Novell NetWare 3.11 network running common applications. The test generates realistic file and print traffic across the network to the file server.

The file servers came configured with 32MB of RAM and 2 to 4 gigabytes of disk space across SCSI hard drives. Our test bed was configured with 35 clients, consisting of five Dell 25-MHz 486s, five Dell 33-MHz 386s, five Compaq 20-MHz 386SXs, and 10 AST 12-MHz 286 computers. We connected all clients, as well as an additional AST 12-MHz 286 (for administration purposes) to the file server across four coaxial Ethernet segments, which were connected to one Eagle NE3200 network interface card within the server.

Our InfoMark test suite runs under NetWare 3.11. The server was configured using the default configuration, with no optimizations other than increasing the Receive Packet Buffers = 150. We installed our suite from a "master" server to ensure continuity across each of the test iterations.

We ran our test suite in four configurations for each of the servers, with 10, 20, 30, and 35 clients, respectively. We performed each run twice to ensure data validity.

**Speed — SYSmark92 (desktop):** This benchmark measures the performance of 11 popular business applications. The elapsed times of these applications are combined to produce the SYSmark92. This score is a rate (work divided by time), so higher numbers indicate better performance.

The test suite is broken down into application categories:

**Database:** The dBase IV 1.1 script creates several tables for a typical database with fields for parts, orders, customers, and ZIP code. The script then steps through a series of queries, displaying some while redirecting others to files. The Paradox 3.5 script posts several hundred debit or credit transactions, as well as a variety of queries, data validations, and reports.

**Desktop graphics:** Harvard Graphics 3.0 for DOS creates a presentation containing charts generated manually as well as from Wk1, Excel, and ASCII files. After formatting, slides are prepared for output to devices, including plotters.

**Desktop publishing:** The PageMaker 4.0 test produces two documents — a

PHOTOS BY STEPHEN FINEBERG

two-page newsletter with text, a table, and graphics; and a ledger-size poster. The script uses such features as formatting, spell checking, hyphenation, tracking, and printing.

**Software development:** The Borland C++ 2.0 test builds 10 object-oriented applications or Dynamic Link Libraries from sources using various memory models. Similarly, the Microsoft C 6.0 test builds three applications from source.

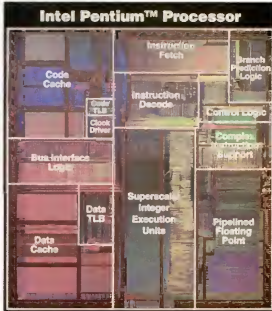
**Spreadsheet:** The Excel 3.0 work load includes several spreadsheets, including a mathematical worksheet, a break-even analysis, a text form, and several tax

forms. Lotus 1-2-3 3.1+ creates an amortization table that includes cost-tracking features, then loads a companywide budget and builds several charts. The Quattro Pro 3.0 script works with four principal applications: a companywide budget consolidation, analysis of major customer accounts from a database, forecasting several plant-consolidation options, and a small text table. The spreadsheet scripts exercise such features as copying cells, editing formulas, and printing.

**Word processing:** The Word for Windows 2.0 test uses several short documents and one large document. The

script uses ASCII file conversions, formatting, spell checking, mail merge, plotting graphics, print previewing, and printing. In WordPerfect 5.1 for DOS, the script formats and print previews a 10-page document, creates a smaller document with multiple columns and a graphic, and creates a simple one-page memo.

**Compatibility (desktop):** To test software compatibility, we ran the following applications: Borland C++ 2.0, Desqview 2.4, Excel 3.0a, Harvard Graphics 3.0, LAN Manager 2.1, Lotus 1-2-3 3.1, Microsoft C 6.0, MS-DOS 5.0, Novell NetWare 3.11, OS/2 2.0, PageMaker 4.0, QEMM 6.02, Quattro Pro 3.01, Windows 3.0a and 3.1, Word for Windows 2.0, and WordPerfect 5.1.



Intel's Pentium processor offers superscalar architecture.

To test hardware compatibility, we installed and tested an Adaptec SCSI host adapter, Hewlett-Packard ScanJet IIP. [See HOW WE TEST, page 62](#)

## EXPANDABILITY

**INFO  
WORLD**

### Pentium desktop computers

	Compaq Deskpro 5/66M	Unsys PW2 Advantage Plus 5606
Maximum 32-bit system RAM	144MB	192MB
Standard system RAM support <sup>1</sup>	144MB	192MB
Maximum external cache RAM	256K	256K
Number of 32-bit slots	5	6
Number of 16-bit slots	0	0
Number of 8-bit slots	0	0
Free slots after configuration <sup>1</sup>	4	5
Number of external drive bays	3	3
Number of internal drive bays	1	2
Free drive bays after configuration <sup>1</sup>	2	3
Largest hard drive available	1.05GB	1GB
Intel, Wottek coprocessor support	No	No

For details of expandability and other scoring criteria, [see How we TEST, page 50](#).

<sup>1</sup> Maximum RAM supported by main board.

<sup>2</sup> Configuration composed of video adapter, drive controller(s), serial/parallel ports, memory, one hard drive (33k- or 34k-inch), and one half-height floppy drive (33k- or 34k-inch).

## FEATURES

**INFO  
WORLD**

### Pentium desktop computers

	Compaq Deskpro 5/66M	Unsys PW2 Advantage Plus 5606
System bus <sup>1</sup>	EISA	EISA
Number of parallel ports	1	1 <sup>2</sup>
Number of serial ports	2	2 <sup>1</sup>
Number of game ports	0	0
Built-in mouse port	Yes	Yes
Built-in VGA	Yes	Yes
Built-in IDE controller	Yes	No
Power supply	240W	200W
Memory type	SIMM	SIMM
Chip sizes supported	1MB, 4MB, 8MB, 16MB, 32MB	1MB, 4MB, 8MB, 16MB
Supports mixed sizes <sup>3</sup>	Yes	Yes
Alternate processor speeds	Yes	No
Upgradable	No	Yes
Keyboard lock/disable	Yes	Yes
System lock/disable	Yes	Yes
Case lock	Yes	Yes

<sup>1</sup> ISA = Industry Standard Architecture; EISA = Extended Industry Standard Architecture.

<sup>2</sup> Bidirectional port (e.g., you can hook up a scanner).

<sup>3</sup> One serial port is both synchronous and asynchronous.

<sup>4</sup> Must be same size chip within a bank; can mix sizes among banks.

## BENCHMARKS

**INFO  
WORLD**

### Pentium desktop computers

#### SYSmark92

Compaq Deskpro 5/66M	201.60
Unsys PW2 Advantage Plus 5606	193.86

#### SYSmark92 Database

Compaq Deskpro 5/66M	222.38
Unsys PW2 Advantage Plus 5606	189.28

#### SYSmark92 Desktop graphics

Compaq Deskpro 5/66M	200.62
Unsys PW2 Advantage Plus 5606	186.30

#### SYSmark92 Desktop publishing

Compaq Deskpro 5/66M	204.38
Unsys PW2 Advantage Plus 5606	207.94

#### SYSmark92 Software development

Compaq Deskpro 5/66M	145.28
Unsys PW2 Advantage Plus 5606	167.34

#### SYSmark92 Spreadsheet

Compaq Deskpro 5/66M	194.53
Unsys PW2 Advantage Plus 5606	194.69

#### SYSmark92 Word processing

Compaq Deskpro 5/66M	208.17
Unsys PW2 Advantage Plus 5606	198.98

← Worse

Better →

## PRODUCT ANALYSIS

## Pentium servers

	ALR ProVeisa V	Hewlett-Packard NetServer 5/60 LM
<b>InfoMark</b>	85.7MB per minute; 60-MHz Pentium processor.	88.7MB per minute; 60-MHz Pentium processor.
<b>Expandability</b>	Seven drive bays and six slots open after configuration; 256MB of 32-bit system RAM.	Four drive bays, seven slots open after configuration; 384MB of 32-bit system RAM.
<b>Documentation</b>	Preliminary users' manual; options, system configuration, and EISA configuration booklets; Publication Map for directing users to appropriate manuals for needed information; table of contents, index; appendices for error messages, hard drive characteristics, specs, and advanced BIOS setup.	Preliminary users' guide; table of contents at beginning of each chapter but no table of contents for entire manual; clear, concise information with definitions of processes; detailed charts, tables; included table for users to fill in own configuration information; troubleshooting section; error messages appendix.
<b>Setup</b>	ROM-based setup with EISA configuration utility on disk; EISA configuration guide included to help with setup; LEDs on front panel for power, hard drive access.	ROM-based setup with EISA configuration utility on disk; easy access to all components; LEDs for power, hard drive, and keyboard lock.
<b>System design</b>	64-bit data path between CPU and cache; 32-bit data path external to the bus; plastic cover protects disk drives and power and reset buttons but maintains visibility of system status lights; keyboard and case locks; "Smart Fan" determines temperature, adjusts speed, and blows air across heat sink; no patches on motherboard.	Small-footprint tower case; fine layout; handy Network Server Mode prevents unauthorized use of input device while server is running as unattended network server; fan embedded in heat sink attached to CPU; no patches on motherboard.
<b>Support policies</b>	Five-year warranty; free on-site service; money-back guarantee; toll-free line; BBS, fax support; extended hours.	Three-year warranty; free on-site service; toll-free line; BBS, fax support; extended hours.
<b>Price</b>	<b>\$10,291</b> list price for our configuration; \$2,395 for 60-MHz Pentium upgrade module; \$2,695 for 66-MHz Pentium upgrade module; will be sold through direct sales and dealer channels.	<b>\$14,996</b> for our configuration; will be sold through dealer channels.



**Company:** Advanced Logic Research, in Irvine, Calif., can be reached at (800) 444-4ALR; fax: (714) 581-9240.

**Test configuration:** 32MB of 70-nanosecond RAM; 512KB of 15-nanosecond RAM cache; EISA bus; 3 1/2-inch floppy drive; four 800MB hard drives in array; UltraStor controller; integrated VGA.



**Company:** Hewlett-Packard, in Sunnyvale, Calif., can be reached at (800) 752-0900.

**Test configuration:** 32MB of 70-nanosecond RAM; 256KB RAM cache; EISA bus; 3 1/2-inch floppy drive; 4-gigabyte disk array with Adaptec controller (four 1-gigabyte drives; RAID 0, 1, 5, or 6); integrated VGA with 512KB of VRAM.

HOW WE TEST / from page 61  
Pentium systems

scanner and card, IBM Token Ring adapter, Intel SatisFaction fax/modem, Orchid S3 video board (ISA and EISA), Matrox TIGA board (MCA), and 3Com Ethernet adapter.

**Expandability:** We looked at the number of slots and drive bays, as well as other features that add value to systems. Some of these features include integrated VGA, VESA slots, largest available hard drive, and RAM capacity.

**DOCUMENTATION:**

At a minimum, documentation should explain how to set up and use the system and include accurate diagrams to illustrate text. In addition, the manuals should be comprehensive, well organized, and well written. However, because the systems we reviewed were betas, the documentation we received was also in preproduction form. In one case, with the Unisys machine, we received no manuals.

**SETUP:**

Here we evaluated how easy it is to configure, reconfigure, and upgrade a system. Items that increased the ease with which a user might set up a system included useful front-panel diagrams, a limited number of jumpers or DIP switches, on-line users' guides for the system or DOS, and such keyboard extras as macro keys. Items that hindered setup included poor slot layout; badly positioned or numerous jumpers and DIP switches; and unprotected or missing reset and power buttons.

**SERVICEABILITY:**

**System design (server):** We looked at two aspects of a file server's design — the quality of construction and security features. The former is important for estimating a file server's reliability. We removed each system's motherboard and examined both sides for signs of patches. Security also is a key issue for file servers. We looked for case locks, system password protection, and well-protected power switches.

**System design (desktop):** We carefully examined systems to see how well they were designed and constructed, looking for standard design and manufacturing practices.

**SUPPORT:**

**Support policies:** We included information on the following criteria: a one-year warranty covering parts and labor, unlimited (but not toll-free) technical support, unconditional money-back guarantees, free on-site service, extended support hours, bulletin board support (for example, on CompuServe), fax support, and a toll-free number.

**Technical support:** We aren't able to provide any technical support information. We couldn't fairly and effectively judge the quality of support for the beta units we were reviewing because the technicians weren't yet knowledgeable about the new systems.

**PRICE :**

This category includes the vendors' approximate list price for their systems. Because computers incorporating Pentium processors have just started entering the channel, many vendors don't have set pricing for their units, so we weren't able to obtain street pricing.

## BENCHMARKS

INFO  
WORLD

## Pentium servers

Scores in megabytes per minute

## 10 clients

ALR ProVista VM4/66d	27.5
ALR ProVista V	26.9
AST Premium SE 4/66d	27.4
HP Vectra 486/66ST	27.0
HP NetServer 5/60 LM	26.9

## 20 clients

ALR ProVista VM4/66d	53.5
ALR ProVista V	52.5
AST Premium SE 4/66d	53.8
HP Vectra 486/66ST	52.1
HP NetServer 5/60 LM	53.0

## 30 clients

ALR ProVista VM4/66d	76.7
ALR ProVista V	75.6
AST Premium SE 4/66d	78.3
HP Vectra 486/66ST	73.6
HP NetServer 5/60 LM	77.2

## 35 clients

ALR ProVista VM4/66d	86.5
ALR ProVista V	85.7
AST Premium SE 4/66d	89.1
HP Vectra 486/66ST	82.6
HP NetServer 5/60 LM	88.7

Worse

Better

## SUPPORT

INFO  
WORLD

## Pentium servers and desktop computers

	ALR ProVista V	Compaq Deskpro 5/66M	Hewlett-Packard NetServer 5/60 LM	Unisys PW2 Advantage Plus 5806
Warranty period	5 years <sup>1</sup>	3 years	3 years	1 year
Free on-site service	1 year <sup>2</sup>	1 year	3 years	No
Money-back guarantee	30 days	No	No	No
Free vendor-supplied support	Yes	Yes	Yes	Yes
Toll-free line	Yes	Yes	Yes	Yes
BBS support	Yes	Yes	Yes	Yes
Fax support	Yes	Yes	Yes	No
Support hours <sup>3</sup>	8a-5p, 7a-1p Sat, PT	24 hours, 7 days	24 hours, 7 days	8a-8p, ET

<sup>1</sup> Five-year warranty on system components; 15-month warranty on other components (e.g., third-party peripherals).<sup>2</sup> \$9.95 to register; 2-year on-site service available for \$139 (includes 48-hour response time).<sup>3</sup> Support hours are weekdays unless noted; ET = Eastern time, CT = Central time, MT = Mountain time, PT = Pacific time.

## Optimized app shows Pentium's mettle

BY TIM CRAWFORD

To really see the performance benefit that Intel is touting for its Pentium processor technology, we ran both 32-bit and recompiled versions of the same application, Pixar's Typestry, on one of the Pentium desktop systems that

we evaluated and on a 66-MHz 486DX2 PC.

Applications that can take advantage of dual data path functionality within the Pentium processor are those that perform intensive floating-point unit (FPU) calculations and/or perform a substantial

See OPTIMIZED, page 64

## FEATURES

INFO  
WORLD

## Pentium servers

	ALR ProVista V	Hewlett-Packard NetServer 5/60 LM
System bus	EISA	EISA
Number of parallel ports	1	1
Number of serial ports	2	2
Number of game ports	0	0
Built-in mouse port	Yes	Yes
Maxtor drive model; size	Maxtor MXT 540S; 500MB	HPD1653A; 1GB
Hard drive interface; interleave	SCSI; 1:1	SCSI-2; 1:1
Controller	UltraStor 124F; no cache	Adaptec 7770; no cache
Built-in IDE controller	Yes	Yes
Power supply (watts)	300	386
Memory type	SIMM	SIMM
Chip sizes supported	1MB, 4MB, 16MB	4MB, 8MB, 16MB, 32MB
Supports mixed sizes	Yes	Yes
Alternate processor speeds	Yes	Yes
Upgradable CPU	Yes	No
Video	Built-in Western Digital 90C31 VGA; 1MB VRAM	Western Digital 90C31; 512KB VRAM
Keyboard lock/disable	Yes	Yes
System lock/disable	Yes	Yes
Case lock	Yes	No
Dealer/direct channels	Both	Dealer

## EXPANDABILITY

INFO  
WORLD

## Pentium servers

	ALR ProVista V	Hewlett-Packard NetServer 5/60 LM
Maximum 32-bit system RAM	256MB	384MB
Maximum RAM supported by motherboard	256MB	128MB
Maximum RAM supported by expansion card	0	256MB
Maximum external cache RAM	512KB	256KB
Total number of 32-bit slots	8	8
Total number of 16-bit slots	2	0
Open slots after configuration <sup>1</sup>	6	7
Total number of proprietary slots	2	2
Total number of external drive bays	5	8
Total number of internal drive bays	7	8
Open drive bays after configuration <sup>1</sup>	7	11
Largest hard drive available	1.2GB	1GB
Intel/Weitek coprocessor support	No	No

<sup>1</sup> Configuration composed of video and drive controllers, NICs, serial and parallel ports; figure does not include proprietary slots for CPU or RAM.



**PENTIUM** / from page 59**Servers and desktops**

Windows might be a waste of money. Organizations with overburdened servers may benefit from moving to Pentium-based systems, especially because the first Pentium applications are likely to be network operating systems and database servers. And because code that is optimized for Pentium will run on 486s, Pentium versions of applications may spread throughout the enterprise.

Our tests showed that applications optimized for Pentium did run faster on 486s than versions compiled for that processor.

**PRICE PREMIUM.** If you buy a Pentium system today, you're sure to pay top dollar. The average prices for desktop and server systems we tested were \$7,543 and \$12,643, respectively, which is more than most users would be willing to spend.

Will prices come down? That depends on how quickly other chip manufacturers release 486DX2 work-alikes. In its recent lawsuit against AMD, Intel stated that it intentionally keeps chip prices high as long as it has a monopoly on a particular

generation of microprocessors. Then Intel drops the prices precipitously once other vendors produce similar chips. If you want a good deal, you may wish to wait until other companies are nipping at Intel's heels before buying.

**HOT CHIPS.** Whether you are buying a new Pentium system or upgrading an existing 486, another source of concern will be the new processor's potential for overheating. According to Intel, Pentium draws 14 to 18 watts of power, which is two to three times as much as a 50-MHz 486DX. All of this power exits your system as heat. And although Pentium is designed to run at a maximum temperature of 185 degrees Fahrenheit, it is not a good idea to push the chip.

How do manufacturers keep Pentium chips from literally turning up? A tall (0.65-inch) heat sink, such as the one already found on the 68040 chips in the Macintosh Quadra, is a good start, but it's not enough. The ambient temperature can't be too high, and air must circulate rapidly over the chip. One approach is to place the Pentium on a daughterboard rather than on the motherboard, which has poor air circulation due to the peripheral boards that sit close to it, and po-

sition a fan near or on top of the processor.

Finally, although the Pentium has large internal caches, it really needs a big secondary RAM cache to work well. This cache, which must use extremely fast chips, will make the complete system even hotter. In the long run, Intel is certain to produce Pentium chips that run at 3.3 volts, and Intel's System Management Mode, which is built into Pentium, will help turn parts of the computer off when the system is idle.

Most of the systems we tested included fans that blow air directly over the processor and its heat sink. ALR, however, has included a "Smart Fan" in its ProVista V, which automatically senses the temperature of the system and adjusts the speed of the fan accordingly.

**PENTIUM UPGRADABLE? MAYBE.** If you have bought a computer that offers a socket for the Pentium OverDrive chip, or P247, you may be able to upgrade your system to Pentium technology when this processor is available. There are some caveats, however.

Some systems with sockets for the P247, especially those pieced together from components by small clone makers,

do not provide sufficient cooling for the new chip. And don't expect the five- to 10-times performance increase that Intel optimistically claims for Pentium. Because the P247 will have to use a narrower 32-bit bus, and most software won't be optimized for Pentium, the performance increase is more likely to be a factor of approximately two.

**WAIT AND SEE.** If you are trying to decide if a Pentium system is for you, the criteria are simple. You should upgrade if you have identified your system's CPU as the bottleneck in a critical task and if Pentium-optimized software is available for that task. Even Intel does not expect everyone to upgrade. In its literature, Intel flatly states that it expects the 486 to remain the mainstream processor for several years to come. But if you think that Pentium may eliminate some of your bottlenecks, Intel offers a tantalizing look at the industry's new muscle machines.

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**OPTIMIZED** / from page 63**Optimized application shows Pentium's mettle**

amount of "loopy" (as it is known in the coding world) source code.

Typstary, a three-dimensional rendering program, generates a phenomenal number of FPU processes. Our goal in this test was to flood the processor's FPU with processes in order to determine the advantages over the Pentium's x86 sibling.

To do this, we created identical test objects with texture qualities (e.g., shading) using both versions of Typstary: the 32-bit Version 1.1c and the Pentium-optimized version.

Our testing proved that optimized applications containing a lot of floating-point operations do provide significant performance enhancements on Pentium computers. Running the nonoptimized version of Typstary on both systems, the Pentium machine proved 79 percent faster than the 486DX2/66. The Pentium posted an 82 percent performance improvement over the 486DX2/66 when running the recompiled version of Typstary. There was just a 3 percent improvement between the 32-bit and Pentium-optimized versions when they were

BENCHMARK <b>INFO WORLD</b>			
Pixar Typstary	66-MHz 486DX2	Pentium	
32-bit version	23:42	4:55	
Pentium-optimized	22:59	4:15	
Times in minutes:seconds.			

run on the 66-MHz 486DX2.

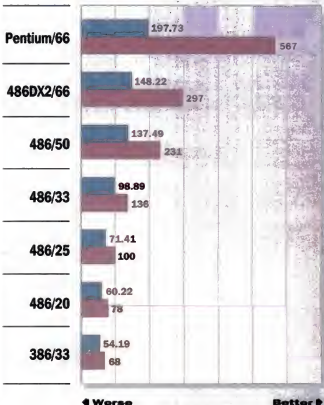
Although our benchmark times were far better on the Pentium than on the 486-based system, be forewarned. In performing our tests, we determined that the software video driver you use can slow the Pentium's performance to almost that of a 486.

However, as our standard benchmarks—InfoMark and SYSmark92—attest, you won't see much gain in speed when running today's typical business applications (e.g., word processors, spreadsheets, etc.) because they don't fully utilize the performance horsepower of the Pentium processor.

Typstary, Version 1.1c (32-bit) is available now for \$299.

Typstary 2.0, currently in beta, will include both 32-bit and Pentium-optimized versions and will be available in September.

Pixar, based in Richmond, Calif., can be reached at (800) 888-9856 or (510) 236-4000.

**PERFORMANCE INDICATOR****INFO  
WORLD****Truth in numbers****■ SYSmark92****■ ICOMP**

It's interesting to compare InfoWorld's average BAPCo SYSmark92 scores for each x86 processor class vs. Intel's ICOMP scores. The higher up in the Intel family you go, the more inflated ICOMP is as a predictor of real-world performance on common DOS and Windows applications.



We created a three-dimensional object using Pixar's Typstary to test Pentium performance by stressing the FPU.

## REVIEWS

## ALR's Evolution 486s offer speed, local bus

Expandability, sturdy construction make this a solid desktop choice

BY ANDREAS UITERWIK  
TECHNICAL ANALYST  
AND TRACEY CAPEN  
SENIOR REVIEWS EDITOR

When it comes to building PC hardware, you either evolve quickly or become extinct. Advanced Logic Research Inc.'s latest foray up the developmental tree is the Evolution Series of ISA and EISA desktop computers. In this review, we looked at the ALR Evolution IV, a 33-MHz 486DX ISA PC. This fast, compact, nicely designed system is one of ALR's first PCs with VESA VL Bus-compatible local bus adapter slots. ALR has also added a proprietary extension to local bus, called ALR Cache Local Bus Slot.

To find out whether the Evolution crawls or flies, we used the same tests developed for our product comparison of 33-MHz 486 PCs, October 19, 1992, page 66. The Evolution we tested had 8MB of RAM and a 250MB integrated drive electronics (IDE) hard drive. Its Tri-Combo adapter was packed with 2MB of high-speed video RAM (VRAM).

The Evolution is not the fastest 33-MHz 486 we've tested, but it was still very good in both the SYSmark92 and multitasking tests. Its 110.80 SYSmark92 score is only 4 percent behind the Keydata 486/33 WindowStation, the fastest PC in our Intel-based 33-MHz 486 comparison. The ALR Evolution is 5 percent faster than our average score for 33-MHz 486s.

The ALR's latest creation also has above-average multitasking speed. At 1

minute and 18 seconds, it was 4 percent above the average speed.

Our sample Evolution had flawless compatibility with our suite of PC hardware and software products.

Despite its small-footprint design, the Evolution has terrific expandability. Its base configuration has 4MB of RAM, but the three standard SIMM sockets give the Evolution a top-end capacity of 52MB (using three 16MB SIMMS). There are six 16-bit slots, two of which have VL Bus-compatible extensions. A third 16-bit slot adds ALR's proprietary 32-bit Cache Local Bus extension. This slot provides a high-speed bus between the 256KB of external RAM cache on ALR's Tri-Combo board and the CPU. It also gives a 32-bit video path between the board and CPU. Setting up the Evolution for testing left five slots open.

For a desktop PC, there is plenty of room for floppy disk drives, CD-ROM drives, and hard disks. The front panel has two 5 1/4-inch bays and one 3 1/2-inch bay. With some careful planning, you can load the ALR with a 5 1/4-inch floppy drive, 3 1/2-inch hard drive, and a CD-ROM player and still have room for a tape backup. Inside are mounts for up to three 3 1/2-inch hard disks.

For documentation, ALR is working under the fairly safe assumption that users prefer on-line to on-paper. A thin setup guide was packed with the Evolution, along with concise DOS and Windows manuals. There is also a comprehensive Windows-based on-line help system that lets you browse and click on many topics, such as setting up hard



Although it is a small-footprint machine, the Evolution still gives desktop users ample room for peripherals.

drives, RAM configuration, setting up the Tri-Combo board, technical support numbers, and so forth.

As with most PCs today, the Evolution is essentially plug and play. Our system had Microsoft DOS 5.0 and Windows 3.1 loaded. (The system is shipping with DOS 6.0 now.) It also had the video drivers and utilities installed. The setup utility is in ROM and lets you set up system security in addition to the standard configuration options.

The Evolution is a clean and simple design. The top lifts slightly back and up, making it especially easy to remove. Adding or removing RAM is fairly easy, provided you have not installed any drives in the 5 1/4-inch drive bays. ALR uses a Zero Insertion Force socket for the 486 CPU, so it's unlikely you will damage the CPU if you upgrade.

The Evolution supports 33- and 66-MHz 486 processors from Intel, plus the Intel OverDrive chip and the Intel Pentium upgrade chip, which has yet to be released. To keep the Pentium from dying of heat fatigue, the system has two cooling fans, one of which draws air from the front panel and blows it directly over the CPU socket.

ALR has put a different spin on combination boards with the Tri-Combo adapter. The board is packed with 24-bit color video (using ATI mach32 video chips), up to 2MB of high-speed VRAM, a 10Base-T and 10Base-2 Ethernet adapter, and 256KB of write-back RAM cache. This gives you the option of selecting an all-in-one adapter (with nearly all of the features most PC users are looking for) or mixing and matching your choice of peripheral adapters.

ALR has a generous warranty for its Evolution series: five years on parts and 15 months on labor. ALR also gives you a full-free support line, BBS support, and a 30-day money-back guarantee.

Overall, ALR's Evolution is an impressive value. The system we tested has a very competitive list price of \$2,569. (List prices for the Evolution series start at \$1,549.) The system is well designed, sturdy, and flexible. □

## REPORT CARD

INFO  
WORLD

33-MHz 486DX ISA Computer  
ALR Evolution IV



Criteria	(Weighting)	Score
<b>Performance</b>		
SYSmark92	(250)	Very Good (187.50)
Multitasking	(125)	Very Good (93.75)
Compatibility	(150)	Excellent (150)
Expandability	(75)	Very Good (56.25)
Five 16-bit slots (two 32-bit VESA) and four drive bays free after configuration.		
Documentation	(50)	Good (31.25)
Comprehensive on-line manual.		
Setup	(75)	Very Good (56.25)
Zero Insertion Force CPU socket; CMOS setup.		
<b>Serviceability</b>		
System design	(50)	Excellent (50)
Clean, sturdy construction; patch-free motherboard; flash upgrade BIOS; Tri-Combo adapter.		
Support policies	(50)	Excellent (50)
Five-year parts, 15-month labor warranty; one-year on-site service for \$9.95; toll-free support line; extended hours.		
Technical support	(75)	Good (46.87)
Score based on reader survey.		
Value	(100)	Very Good (75)
Based on reader survey.		
<b>Final score</b>		<b>7.9</b>

## PRODUCT SUMMARY

**Company:** Advanced Logic Research, in Irvine, Calif., can be reached at (800) 444-444R or (714) 581-6770; fax: (714) 581-9240.

**List price:** \$2,599 for our configuration; sold through dealer channels and direct sales.

**Features:** 33-MHz 80486DX CPU; one parallel, one mouse, two serial ports; 200-watt power supply.

**Peripherals:** Enhanced keyboard; Tri-Combo local bus adapter with VGA, 256KB RAM cache, and Ethernet ports.

**Storage and memory:** 250MB hard disk with IDE controller; 1.44MB 3 1/2-inch floppy drive; 6MB of 70-nanosecond RAM, 52MB maximum.

**Pros:** Above-average performance; VESA compatibility; on-line documentation; competitively priced.

**Cons:** None significant.

**Summary:** The ALR Evolution gives you room to grow at a reasonable price.

## BENCHMARKS

INFO  
WORLD

## 33-MHz 486DX computers

	ALR Evolution	Keydata 486/33 WindowStation <sup>1</sup>	ALR Flyer 32LCT 40X/33 <sup>1</sup>	Average 33-MHz 486DX
<b>Performance tests</b>				
SYSmark92 <sup>2</sup>	110.80	114.98	111.41	105.57
Multitasking <sup>3</sup>	1:18	1:22	1:19	1:21
<b>SYSmark92 application tests:</b>				
Database	107.69	122.99	115.27	
Desktop graphics	113.33	133.88	103.81	
Desktop publishing	127.12	107.05	117.01	
Software development	101.56	143.31	111.57	
Spreadsheet	111.56	122.99	112.05	
Word processing	106.23	105.95	111.32	

<sup>1</sup>Keydata and ALR Flyer 32LCT reviewed in product comparison of 33-MHz 486DX PCs, October 19, 1992, page 66.

<sup>2</sup>Higher numbers indicate better performance.

<sup>3</sup>Lower numbers indicate better performance.

## INSIDE REVIEWS

Setting the record straight: LCD projection panels ..... 66

Guide to reviews ..... 66

# Setting the record straight on LCD projection panels

In our June 7 (page 70) product comparison of 15 LCD projection panels we inadvertently omitted a section of the comparison and made some errors.

The "How we test" section (printed below starting with "Performance:") should have accompanied the comparison. This section provides the testing and scoring criteria for the LCD projection panel comparison.

We also mistyped some information about Proxima Corp.'s Ovation 820, the lowest scoring LCD panel in the comparison. The price (incorrectly quoted in the executive summary) is \$5,695. We accidentally swapped the information for the Proxima Ovation 820 and the Proxima Ovation 810 in the features chart.

After publication of the comparison, Proxima notified us that the unit it had shipped to us for testing had damaged components, which resulted in many of the Proxima Ovation 820's low scores. A unit Proxima Corp. supplied for testing was fully functional. Therefore, we ask that you disregard the evaluation of this unit. Proxima will soon ship an updated version of the Proxima Ovation 820, which we will review.

In addition, the Ask 16.7 and the Apollo 16.7 LCD panels are identical units distributed by different vendors. Although they are manufactured by the same factory and theoretically should offer identical performance, our taste test participants scored them differently. To confirm our findings, Apollo sent us two more units to match against their original test unit and the Ask 16.7 panel. We found that the two new units were better performers than the one used in the product comparison and closely matched Ask's performance. We regret that the unit we tested was not on par with Apollo's quality standards. As with the Proxima Ovation 820, we have disregarded the Apollo 16.7's score. But because of the involved nature of the taste test, we cannot retort nor rescure Apollo's unit.

## PERFORMANCE:

We scored performance in four categories: DOS text and graphics, screen geometry, color reproduction, and an application suite. Each of the four tests included up to eight separate screens.

We connected the panels (and a NEC SFG monitor that we used as a baseline device) in three groups of five to a Network Technologies video-splitting device (the Vopex-RV). This splitter allowed us to compare the image definition of all the panels simultaneously. We ran the test on a single notebook computer.

We also used a series of 3M 955 high-illumination overhead projector as the projection source. We built portions of the test suite using Sonera Video Utilities.

To evaluate the panels, we assembled a baker's dozen of InfoWorld staff to participate in a rather grueling taste test (it took an average of 2 hours to complete). We ran three test sessions as the projection source. We built portions of the test suite using Sonera Video Utilities. To evaluate the panels, we assembled a baker's dozen of InfoWorld staff to participate in a rather grueling taste test (it took an average of 2 hours to complete). We ran three test sessions as the projection source. We built portions of the test suite using Sonera Video Utilities.

The participants evaluated the panels' characteristics on a scale of 1 to 7, with 7

representing a perfect score. We then collected the evaluations and calculated each product's performance in the four categories as a percentage of the total possible points for each category. We designated word scores (excellent, very good, good, etc.) for ranges of points by dividing the total possible points into equivalent portions.

In each performance category, we lowered the score for fuzzy output, image bleeding (color overlap), visibility of scan lines, flicker, halos around graphics, dimness, and variable display quality across the screen.

Because of the overall simplicity of these units, we opted not to evaluate technical support. If a panel fails to function, it is probably broken and will usually have to be returned to the manufacturer or dealer for repair.

**DOS text and graphics:** The DOS text and graphics test rated how accurately the panels displayed text and graphics under DOS. We used Sonera Video Utilities to produce the images. The test participants looked for font and graphics clarity, even and consistent brightness (both foreground and background) of the text and graphics, stability of the text and graphics, and the contrast between the foreground and the background. There were 100 points possible in this category.

**Screen geometry:** The screens used for our screen geometry tests displayed test patterns and shapes (boxes, circles, Xs, etc.). We looked for even screen framing, no image distortion (compared to the monitor), straight lines represented without curvature or other distortion, and images displayed without compression or expansion. There were 100 total points in this category.

**Color reproduction:** To test color reproduction, we displayed three screens of color (red, blue, and green). We evaluated the panel's performance based on consistent brightness and color intensity across the screen. We also displayed a screen with multiple color bars and evaluated how well the colors matched the colors displayed on the monitor. There were 100 points possible in this category.

**Application suite:** The application suite displayed several applications running under Microsoft Windows 3.1, including the Windows Program Manager and presentations created in Microsoft PowerPoint. Among the images were charts, text, a colorful map, and a well-known work of art. Participants evaluated crispness and readability of text, integrity of image detail, consistent focus across the screen, and trueness of color (compared to the monitor). There were 225 points possible in this category.

**Setup:** We awarded a good score if a panel was either plug and play, or if it was adjustable, the buttons or dials were clearly marked. We awarded a score of satisfactory if it was necessary to consult the instruction sheet the first time we used the product. There were a total of 50 points in this category.

Some notebook computers require that you use a keyboard combination to switch to the external VGA device (whether it be a monitor or LCD panel). The notebook we used for testing did not require a keyboard combination to affect our scoring of the panels.

## COMPATIBILITY:

We evaluated the 15 panels for their

built-in compatibility with various signal standards. Some panels have additional compatibility options you can purchase. (See features chart, June 7, page 76.)

VGA and Mac II are the most common signal standards for LCD panels, especially for use in business presentations. Products that are VGA and Mac II compatible received a score of satisfactory. To earn a score of good, a product also had to be compatible with NTSC, the video and television signal standard. We awarded a score of very good to products also compatible with S-Video, PAL, and SECAM signal standards. There is a total of 75 points in this category.

## SUPPORT:

**Support policies:** A one-year warranty covering parts and labor and unlimited (but not toll-free) technical support from the vendor earned a satisfactory score. We awarded bonuses for unconditional money-back guarantee, on-site service included in the purchase price; extended support hours; bulletin board support (e.g., CompuServe); and a toll-free number. We subtracted points for no technical support, limited support period, or dealer-only support. There are 50 points possible in the support policies category.

## WEIGHT:

We weighed each panel alone, with its cables, and then with its accessories (case, pointing devices, etc.). We scored the weight of the unit with cables—the minimum requirement for operation. The lightest product got the full points possible (50). The other products received a percentage of the total number of points based on their weight.

## PRICE:

Although similar in performance, these panels varied in price from \$3,995 to \$8,995. Therefore, we weighted price heavily (250 points). The lowest priced panel received the total possible points. All other panels received a percentage of the total points based on their prices.

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## InfoWorld guide to reviews

### REVIEW SCORING

InfoWorld reviews only finished, production versions of products, never beta-test versions.

Products receive ratings ranging from unacceptable to excellent in seven categories. Scores are derived by multiplying the weighting (in parentheses) of each criterion by its rating, where:

**Excellent = 1.0** — Outstanding in all areas

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**Good = 0.625** — Meets essential criteria and includes some special features.

**Satisfactory = 0.5** — Meets essential criteria.

**Poor = 0.25** — Falls short in essential areas.

**Unacceptable or N/A = 0.0** — Fails to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little. Weightings represent average relative importance to InfoWorld readers involved in purchasing and using that product category.

You can customize the report card to your company's needs by using your own weightings to calculate the final score.

We now score speed and price for hardware products by a mathematical method. The fastest or least expensive product in each of those two categories receives the maximum points possible. All other units receive a percentage of the maximum points determined by dividing their results by the leader in the category. For example, a product that is twice as expensive as the lowest cost unit receives half the points.

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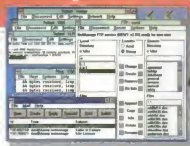
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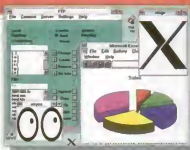
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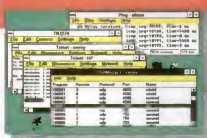
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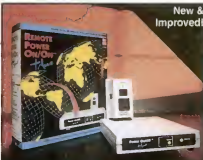
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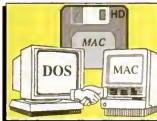


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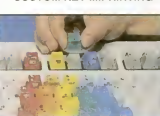
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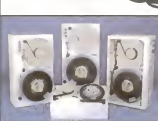
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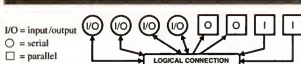
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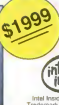
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## EDITORIAL INDEX

<b>Network Applications</b>	
Blue Laser NetWare Loadable Module ..38	
Digital Communication Comm Server, Version 1.3.....37	
Frye LAN Director, Version 1.5.....38	
Microcom LANtard, Version 2.0.....38	
NoStop Network, Version P3.0.....40	
Net Satisfaction, Version 2.0.....37	
QuickMail MCL.....37	
Microsoft X.400 gateway, Version 3.2...37	

<b>Network Hardware</b>	
Cabletron MicroMMAC, SEHI, SEH, BRIMs.....37	
Chipcom Online Ethernet Interconnect Modules.....38	
IBM Token Ring adapters.....40	
IBM 8250-06S, 8222 hubs.....40	
Legacy SmartArray disk array subsystem.....36	

<b>Network Management</b>	
Conner's Hierarchical Storage Management System.....7	

<b>Peripherals</b>	
PageBlaster Universal FM protocol converter.....24	
Samtron SC-528MXL monitor.....32	
ScanMan Easy Touch boardless scanner.....29	
Speech Value Packs.....24	
VideoSpigot video-capture card.....24	
VideoVision Studio video board.....29	

<b>Printers</b>	
Genicom Model 1220 dot-matrix printer.....24	
Pictography 3000 thermal transfer printer.....24	
Portable StyleWriter ink-jet printer.....24	

<b>Productivity</b>	
Alpha Four database, Version 3.0.....16	
Bitstream WordPerfect 6.0 FontPack.....13	
Crystal Ball, Version 3.0.....20	
File Magic Plus, Version 3.0.....20	
InfoPower HR.....13	
LaserJet Signature Macro.....13	
Lotus Improv, Version 2.1.....13	
Macromedia Smart SD.....16	
Microsoft Publisher, Version 2.0.....13	
Microsoft RBase, Version 4.5.....13	
PacketRay, Version 5.0.....22	
PeopleSoft Human Resource Management System.....13	
Win-911 alerting program.....20	

<b>Systems</b>	
ALR Evolution.....65	
ALR ProVista V.....58	
Altura Tura line.....32	
Chaplet NBD 486 DX-33T color notebook.....32	
Compaq Deskpro 5/66M.....58	
DTK Graphics 4V1.....32	
Hewlett-Packard NetServer 5/60 LM.....58	
Panasonic CF-1000K notebook.....36	
Procom Technology CD Tower-DS.....29	
Samsung ValuePlus.....29	
Unijays PW2 Advantage Plus 5606.....58	
Zenith Data Systems Z-400+ line.....29	

<b>Tools</b>	
DS Lab.....13	
Fastback Plus for Windows, OS/2.....20	
PS Error, Version 3.0 for Clipper.....20	
Seamanager, Version 1.5.....13	
SQL/Workbench, Version 2.1.....22	
TransPro for Windows.....22	
Trinix InfoHub.....20	
Video for DOS.....16	

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## UPCOMING IN INFO WORLD

## JULY 19

## PRODUCT COMPARISON

**LAN Utilities.** Network managers use LAN utilities to monitor, administer, and troubleshoot their networks. *InfoWorld* compares several leading products in the category, including Frye Utilities for Networks, Intel LANdesk Manager, and Novell NetWare Services Manager. We will evaluate performance in every major LAN administration area, including application metering, remote monitoring, traffic monitoring, centralized user maintenance, software inventory control, and auto-alarm capabilities.

## ENTERPRISE COMPUTING

**Feature:** IS training and career development: What IS managers need to consider when they are hiring, developing, and expanding their corporate development and support staffs.

**Management:** When is it a good idea to outsource the management of your corporate LAN?

## JULY 19

## ENTERPRISE COMPUTING

**Feature:** A look at Novell's Network Management System, including third-party support, costs, and functionality.

**Management:** What every IS manager needs to know about middleware, and how some savvy managers have pushed vendors to standardize common application interfaces.

## JULY 26

## PRODUCT COMPARISON

**17-Inch Color Monitors.** More and more people want larger color displays for their PC systems — not for graphics, but for general business use. *InfoWorld* surveys some 10 to 15 17-inch color monitors, including units from Mitsubishi, Nanao, NEC, Optique, Sony, and ViewSonic. We will measure refresh rates and see what resolutions are supported, look for Macintosh and Windows compatibility, compare price and performance as a measure of overall value, and conduct a "taste test" among several users to assess the display quality of each monitor.

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## ADVERTISER INDEX

ACI.....	*36C
Apple.....	30-31
Banyan.....	*36D
Borland.....	2
Compaq.....	5
Corel.....	12
Dell.....	21,23,25,45-47,84
Digital Equipment Corp.....	36E-H
Eastman Kodak.....	26-27
Gateway.....	14-15
Hayes.....	9
Hewlett-Packard.....	6-7,33-35
IBM.....	10-11,36,52-53,67
Intel.....	*48C
Micropolis.....	*36A
Microsoft.....	17-19,28,41
Mountain.....	*48B
Northgate.....	83
Palindrome.....	*48A
Quarterdeck.....	*48D-49
Shary.....	*36B
Software Publishing.....	39
Toshiba America Information Systems.....	57

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## Mac NLM upgraded for NetWare 4.0

By TORSTEN BUSSE

Novell Inc. last week announced an upgrade of its NetWare for Macintosh software, which links as many as 1,000 Macintosh clients to NetWare 4.0 servers.

Version 4.0 of the NetWare Loadable Module (NLM), due to ship at the end of the month, does not directly support the much-heralded Directory Services in NetWare 4.0 but uses bindery emulation to access NetWare 4.0 servers.

A subsequent release of the NLM with full Directory Ser-

vices support should be available by year end, said Susan Hanson, marketing manager.

NetWare for Macintosh (NFM) 4.0, which is not backward compatible with NetWare 3.11, allows network administrators to manage a single-user profile for multiple users. Previously, user accounts could only be managed on a per-server basis. Users now maintain a single password that is replicated for multiple servers.

NFM 4.0 also adds support for DOS file-extension mapping, allowing Mac users to view files

by clicking a DOS file icon on their desktop. File mappings can be set up for an entire server or for individual users.

Novell also included the Mac-based NFM Client 1.0 management utility for administering NetWare 3.11 and 4.0 users, which gives NetWare administrators control over user accounts and groups, print queues, and file and folder attributes.

The 1,000-user version is \$1,195. A five-user version will be bundled with NetWare 4.0.

Novell, in Provo, Utah, can be reached at (800) 453-1267.

## APPLE / from page 1

### Will license Mac OS for PowerPC, Intel

"With System 7, the PowerPC will have about 30 percent of the market in that time."

Although Apple is using the PowerPC to break with tradition—Apple's systems and a version of System 7 developed for the PowerPC will be available early in 1994—it will openly challenge Microsoft Corp. for the Intel-based market, as well.

"We see the PowerPC as the

more significant of the two markets," Spitz said, "but bringing out a version of System 7 for x86 will help expand our markets and better establish us as an open systems company."

Apple has not decided how it will implement its OS on different platforms and license the technology to others, Spitz said. For the x86 version of System 7, Apple will probably license the OS to hardware manufac-

turers and offer it as a stand-alone retail product, Spitz said.

For the PowerPC, Apple is likely to be more cautious, Spitz said, and ally itself with top-tier PC manufacturers and a select handful of third-party Mac peripheral vendors.

Apple has talked to a number of those vendors in an effort to gauge interest and determine how the PowerPC clone business would emerge, Spitz said.

Apple already granted IBM and Groupe Bull licenses to run Mac applications in the Unix-based PowerOpen architecture.

## APPWARE / from page 1

### AppWare 'opens' to hard-hitting reviews

technologies from Novell Transformations Inc. Software acquired both firms last year.

Following the development, the AppWare Bus lets developers assemble an application from prebuilt services and features from many different applications. This approach will also let developers create applications without rewriting code.

Currently there is a scarcity of these prebuilt pieces, called AppWare Loadable Modules (ALMs), for developers to use. ALMs must be provided by commercial software vendors or built by in-house developers, and they must comply with libraries in the AppWare Bus.

Users say Novell must convince more software makers to

offer ALMs. "Right now, [AppWare] is like a Lego set with three or four blocks in it," said a user who asked not to be identified. Novell also needs to shore up AppWare with a reusable object repository, distributed management, and the capability to update network objects, they added.

Novell officials said a variety of ALMs are scheduled for release next spring, including ALMs for NetWare services, electronic mail, databases, calendaring, multimedia, document management, and communication services.

The cross-platform piece of AppWare is the AppWare Foundation, a layer of code that provides a superset of application programming interfaces

that allow developers to write applications that will run across multiple-user interfaces, operating systems, and network operating systems.

"Mainframe applications out-number desktop applications 100 to 1," said John Edwards, executive vice president of Novell NetWare desktop systems group. "AppWare is a new layer of software that will shield the complexity of building network applications. Once we shield that complexity, I believe development of true network applications will finally take off."

Novell plans to ship initial developer versions of AppWare products in October, when it will also hold its first AppWare developers conference. ALMs from Oracle Corp., Gupta Corp. and Powersoft Corp. are also expected at that time.

AppWare's commercial release is slated for May 1994.

more expensive than Microsoft's, for which pricing is not yet available. But officials at Q+E Software expect to do well building upon the longtime success of Q+E middleware. A \$99 Pragma, vice president of owners of the Q+E Obedient Pack to up to four driver updates.

Users are eager to see other ODBC drivers. "You still can't get to half of the things you want to get to," said Cary Pragma, vice president of technical marketing for Pre-Page Systems Inc., a Farmington, Conn., insurance industry VAR.

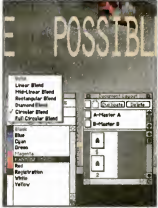
## Product Spotlight

### QuarkXPress 3.2 to be released

QuarkXPress is getting more colorful as Version 3.2 for the Macintosh begins limited shipping this week.

The update of the desktop publishing program from the Denver-based Quark Inc. includes the EfiColor XTension from ElanGraphics for Imaging Inc. offering users consistent color matching across output devices.

Users of 3.1 can upgrade to the \$895 product for \$150, and 3.0 users can upgrade for \$295. The Windows-based 3.2, including the same features as its Mac counterpart, is due to ship in two to three months.



## IBM / from page 1

### Woos large PC sites with extensive service

the company said.

"The Premium Partners Program is a love affair," said Frank Dzubek, president of Communications Network Architects Inc. in St. Louis, Mo., recently getting involved with the company and trying to solve problems that occur because of the size of what you are doing," he said.

The company also announced it will link its PS/2 line into two sublines: Traditional and Enhanced.

The Traditional line is aimed at the same corporate sites as the Premium Partners Program, but the PS/2 Enhanced line is aimed at "early adopters" who want the most "cutting-edge" technology. (See chart, page 1.)

With its Premium Partners Program, IBM intends to address the unique needs and problems IS managers face when companies install thousands of PCs at one time for specific mission-critical applications.

Lately, IBM has relied on its dealers to meet the personal computer needs of large customers.

IBM has already begun the program in a limited fashion

with 20 Fortune 500 customers. Free of charge, these companies get personalized services such as:

- preliminary reviews of the customer's overall design
- disclosure of upcoming IBM product plans,
- priority delivery of back-ordered products,
- an IBM technical contact, and
- preloading customized software.

In its entirety, the services are designed to help customers mix custom software with off-the-shelf products and third-party add-on cards and provide the planning and testing necessary to make the switch smooth and guarantee that everything works together.

Last year, IBM lost significant customers to competitors, such as when State Farm Insurance switched from PS/2s to Hewlett-Packard Co.'s Vectra systems. (See "IBM to fend off clones," July 20, 1992, page 1.)

The Premium Partners Program should be in place by late fall, with about 200 customers. These account for more than 80 percent of PS/2 shipments, Andonian said.

## REQUESTER / from page 1

### Novell set to fix snags in OS/2 Requester

Olbert, director of IBM's LAN systems division, based in Austin, Texas, in an interview last week.

Novell hopes to have a beta copy of the requester ready for testing within a few weeks, according to Richard King, vice president of Novell's service and support, in Provo, Utah.

Meanwhile, users should continue to watch bulletin boards, as neither IBM nor Novell has issued a formal announcement.

"While we have not put out any warning, there has been

plenty of talk on Netware and other bulletin boards, and we have been watching that traffic," said Mike Lukshin of IBM's Enterprise Computing Center, in Austin.

"It could be done tomorrow, or it could be a wait of up to six weeks [for a new NetWare OS/2 requester]," Olbert said.

The OS/2 2.1 requester for NetWare 4.0 also does not fully support directory services, but neither IBM nor Novell could say when a NetWare 4.0-ready version of the OS/2 requester will ship.

## ODBC / from page 1

### First pack of ODBC drivers finally shipping

Meanwhile, Microsoft is putting the finishing touches on ODBC Desktop Software, Drivers 1.0, set to begin shipping in August.

Included will be drivers for Microsoft Access and FoxPro 2.0 or 2.5 data files, which are not yet offered by Raleigh, N.C.-based Q+E Software, according to Colleen Leland, ODBC product manager at Microsoft.

Microsoft's ODBC drivers will access Paradox 3.5 or older files. Q+E's Pack requires that Paradox Engine 3.0 be purchased separately from Borland International Inc. Microsoft will provide Paradox 4.0 compatibility at a later date.

Microsoft will include a Bridge 5.1 driver, although it will require additional software from Novell Inc. At \$199, Q+E's bundle will probably be



## REVIEWS / TEST DRIVES

First Look / Kevin Strehlo

## IBM PC-DOS misses golden chance to eclipse MS-DOS

Given the sad history of Microsoft Corp.'s MS-DOS 6.0, I had very high hopes for IBM's PC-DOS 6.1.

However, after having problems during installation, wrestling with the prehistoric editor, and contemplating how essential DOS is to safe and productive computing, I'm going to hold off recommending PC-DOS 6.1, particularly because the SuperStar compression software advertised on the outside of the box is still in beta testing and won't actually ship until September.

After we're sure SuperStar works, we might recommend 6.1. What's really needed, though, is a complete restructuring of the operating system.

**BACKGROUND.** IBM told us they made many bugs fix to the code they had received from Microsoft. And we approved of IBM's decision to dump DoubleSpace in favor of SuperStar, considering all of the data corruption problems we've seen under MS-DOS 6.0 and DoubleSpace. We even approved of IBM's decision to postpone shipping SuperStar, because they were merely extending the beta test to ensure it was rock solid.

However, IBM should probably add a warning to the PC-DOS 6.1 box stating that SuperStar isn't included (and eliminating the \$1 fee required before IBM will ship it to you).

Still, PC-DOS 6.1 might have been just the ticket—if it had a better set of installation programs than MS-DOS 6.0 and if its utilities were less likely to leave you dangling due to problems during memory optimization or disk compression.

PC-DOS 6.1 simply delivered all of MS-DOS 6.0's great new features—branching in batch files, clean boot, DELTREE, reasonable backup, etc.—without the problems. And hopefully PC-DOS 6.1 would warn users about the complexities of memory optimization, disk caching, and compression.

So you can imagine my disappointment when the manuals contained no real warnings and I encountered serious problems within 10 minutes.

**SUPERSTAR INCOMPATIBILITY.** Being a bit cautious now when it comes to new DOSes, I actually checked the manual before installing PC-DOS 6.1 on a laptop that had SuperStar installed. IBM's manual said installation would be OK with any compatible compression software. And because IBM is including SuperStar, I went ahead with the installation.

So you can imagine my surprise when I received three messages about bad or missing files referred to in my CONFIG.SYS, a warning about an incorrect DOS version, and a notice that I had a bad or missing command interpreter.

It didn't take long to figure out that IBM's install had inserted new lines at the top of my CONFG.SYS, which was not a good idea because the files those lines referenced were unavailable until the SuperStar driver that used to be on the first line was loaded. Fixing that problem still left me



with the other error messages.

What was wrong? Well, it seems SuperStar is listed among the incompatible compression software programs, even though IBM will ship it with PC-DOS 6.1. SuperStar needs to have DOS' boot files on the underlying host drive rather than on the compressed drive, so I took care of that manually. Later, I discovered a message in the README file explaining the SuperStar problem.

I'm sorry, but that is just not good enough. For the installation program to be incapable of handling SuperStar when it's already loaded on a hard drive is completely ludicrous.

**IMPROVEMENTS.** IBM has made several definite improvements over the utilities that ship with MS-DOS 6.0. For example, the Central Point backup utility that comes with IBM's DOS supports tape drives. Also, Central Point's RAMSETUP utility seems less likely to cause problems due to overly aggressive memory optimization than does MS-DOS 6.0's MemMaker.

Yet even RAMSETUP takes some liberties that I would rather it not take. For example, instead of asking if I had any programs that used expanded memory (EMS), RAMSETUP just automatically added NOEMS to the EMMS86 line in my CONFIG.SYS.

**CHANGES IBM SHOULDN'T HAVE MADE.** Sometimes a change isn't an improvement. For example, IBM swapped MS-DOS 6.0's extensive hypertext help for a much more terse help system of IBM's own design.

But the PC-DOS 6.1 change that's completely incomprehensible to me is switching Microsoft's elegant editor for IBM's E Editor. Although E Editor is more powerful (e.g., it allows you to edit multiple files simultaneously, do line drawing, etc.), the purpose of a DOS editor is to be simple to learn and use for quick system file editing. Microsoft's editor does that by following the

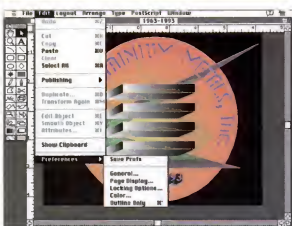
same intuitive conventions used in Windows, such as pull-down menus and the use of Insert and Delete keys.

However, IBM's E Editor is still in the dark ages. I've already been forced through all 13 Help screens on obtuse control commands. Also I dislike its heavy dependence on function keys and the need to know that Escape switches you between command line and edit modes.

If you're upgrading from MS-DOS 5.0, I would think really hard about upgrading in general. It might be better to wait until there's a real improvement with DOS 7.0 next year.

Kevin Strehlo is InfoWorld's executive editor of reviews and testing. First Look examines new products before they have been formally reviewed.

## ILLUSTRATION SOFTWARE



Using CA-Cricket Draw's Preferences dialog box, you can lower screen resolution to speed redraws.

## Feature-rich CA-Cricket Draw III is low-price leader

By Doug and Denise Green  
Contributing Editors

In the competitive field of illustration software, applications such as Adobe Illustrator, Aldus FreeHand, and CorelDraw have a decided edge. However, there is always room for entry-level drawing packages such as Computer Associates International Inc.'s CA-Cricket Draw III, Version 2.0. Draw III is a PostScript-capable Macintosh program that is now System 7 savvy and offers color separations for printing, among a host of other new features.

Draw III now makes working with text and bound text easier. You can enter and edit bound text directly, as with any other Bezier path, on a path using the new Bound Text tool. The new bound text attributes include text alignment, orientation to path, path attributes and display, and PostScript effects.

There is also a new text-to-outlines feature that lets you convert selected text objects into editable Bezier paths to create special effects for text. A spelling checker and thesaurus are also included in Draw III's text features.

CA has made major improvements in document setup, printing, and color options. In addition to the process and spot-color separations, there are options for PostScript Printer Description files (PPD), link setup options, object-level overprinting, automatic tiling, scaling, and page overlay options. You can also specify custom page sizes, custom crop, cut and fold marks, and global color model preferences for HCL, RGB, or CMYK.

CA has fine-tuned object creation and editing as well. New features include an Extrude tool for adding three-dimensional effects, locked object preferences for displaying locked objects as outlines or filled objects for printing or exporting, and precision digital object creation.

Draw III continues to be easy to use and learn. The floating color window lets you add and change outline and fill colors with a few clicks of the mouse button. You can mix colors using HLS, RGB, or CMYK systems and store colors that you mix in tables for use in other documents.

Although Draw III comes close to Illustrator and FreeHand in functionality, there are a few things that CA's program doesn't offer.

For example, there is no print preview mode. Also, Draw III seems to spend more time than other similar applications redrawing objects as you work. Although Draw III offers abundant graduated fill options, these are slow to redraw. You can work around this if you add such fills last or if you lower your on-screen resolution in the Preferences dialog.

We prefer Illustrator for its text and graphing features and FreeHand for the ease with which it lets you stroke and fill objects. At \$249, however, Draw III undercuts the competition by \$200 to \$400 while offering many of the same features. Registered users can upgrade for \$69; a competitive upgrade costs \$129.

Computer Associates, in Ithaca, N.Y., can be reached at (800) 225-5224 or (516) 342-5224.

## SQL ACCESS TOOL

# Quadbase provides SQL access to Xbase data

BY JUDY DUNCAN REVIEW BOARD

SQL access to Xbase data can result in a significant increase in a programmer's productivity. The power of a single SQL statement can replace hundreds of lines of procedural code. Quadbase-SQL for Windows, Version 2.0, from Quadbase Systems Inc., brings this power to Windows developers.

The centerpiece of Quadbase-SQL is a SQL engine that complies with the ANSI SQL-86 Level 2 specifications and is implemented as a Dynamic Link Library (DLL).

You can access the SQL engine through high-level SQL statements embedded directly in your code or from a function-level application programming interface (API). The engine includes extensions to the ANSI standard to support

multitable outer joins, referential integrity, dBase-like functions, and complete concurrency control. Support for host-program variables in SQL statements lets you define selection criteria and other values at run time.

The main target environments for Quadbase-SQL are C/C++ and Microsoft's Visual Basic. In addition, Quadbase is easily integrated with most platforms that can call DLLs, including Smalltalk/V for Windows, ObjectView, SQL.Windows, ToolBook, and Realizer.

Visual Basic users will appreciate the two custom controls included with Quadbase-SQL. A single object can implement a complete browse table or data entry form. The form and table objects can load the data and provide appropriate user interaction with no programming required.

When using embedded SQL, you write SQL commands directly in-line with your code. In the Environment, a preprocessor converts the embedded commands to C code with the appropriate calls to the engine. In the Visual Basic environment, the SQL statements are executed at run time rather than preprocessed into code. A function call passes the SQL string to a DLL that calls the Quadbase engine API.

You must do some additional housekeeping, though, in order to make everything work. You need to define all of the host variables to the engine, duplicating the definitions you have already written in the host language. In order to detect nulls, you must pass an "indicator variable" in addition to a variable to receive a field's value. The indicator variable is a logical value that is true if the field should be interpreted as null.

In addition to the libraries, Quadbase-SQL includes two utilities for interactive SQL statement prototyping, data entry, and user administration — one running under Windows, the other under DOS. The DOS program, dQuery (also available as a stand-alone program), includes query management and report definition. The engine API includes functions to run reports that have been defined using dQuery.

Quadbase-SQL for Windows may have the answer for developers who need flexible SQL access to Xbase data in a Windows application.

Quadbase-SQL for Windows lists for \$995 for a single-user version and \$995 for five users.

Quadbase Systems, in Sunnyvale, Calif., can be reached at (408) 738-6989; fax: (408) 735-6990.

## EXCEL ADD-IN

## Black Mountain add-in is 'Excel-lent'

The 15 utilities ease database, file functions

BY JAN ALTMAN REVIEW BOARD

Do you get impatient traversing the maze of subdirectories when opening and saving files in Excel 4.0? When you work with databases, do you find it tedious to create the database, criteria, and extract ranges? Black Mountain Software's Expert Ease may be the answer. The program is an add-in that provides 15 utilities designed to make life easier for Excel 4.0 users.

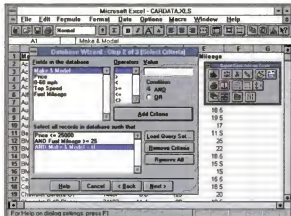
Taking top billing in this package is a utility called Database Wizard that does for databases what Excel's Chart Wizard does for charts.

Database Wizard guides you through database, criteria, and extract definitions, then performs the extract on a separate worksheet. You can save single or multiple queries and sort records after extraction.

Using the Path Finder utility helps having to muddle through directories in the File Open and File Save dialog boxes. Path Finder lets you assign names of up to 250 characters to a file or set of files. Selecting the name takes you to the appropriate subdirectory and lists the associated file(s).

The Cell Stats tool calculates the sum, minimum, maximum, and average of selected cells and puts the answer in Expert Ease's status bar.

Case Tools converted selected text to either uppercase or lowercase. This utility can also trim



Database Wizard guides you through database, criteria, and extract definitions, performing extracts on a separate worksheet.

leading and trailing spaces.

Append Text and Delete Text adds and subtracts characters at the beginning or end of selected cells.

Expert Ease offers other handy time-savers that let you paste in the current date and time (as text or as a formula), print multiple files easily, and cascade or tile windows with a single click. And you can add the tools you use most often to your standard toolbar.

Unfortunately, most of Expert Ease's handy utilities don't let you use Undo to reverse their effect.

I also encountered a couple of small glitches in the program. If you launch the add-in using the Options Add-Ins command, you are asked for a document password. If you select OK, you receive a macro error message. The documentation makes no mention of this.

Another snag crops up when you select the Hide: Tools op-

tion in the Preferences box. When you exit Excel and then restart it, the tools are hidden, but there is no obvious way to redisplay them. Selecting Options Add-Ins from the Excel menu doesn't work because the add-in is already open, and you cannot get to the hidden Preferences box to reset it. You have to rebuild the Expert Ease toolbar. Although this information appears in the manual, there is no specific reference to redisplaying hidden tools.

In general, however, Expert Ease's tools need little explanation, especially if you are already familiar with Excel. Despite the rough edges, Expert Ease provides tools that are a real boon to users working in Excel.

Expert Ease, Version 1.01 lists for \$69.95.

You can reach Black Mountain Software, in San Diego, at (800) 995-6865; fax: (619) 672-9850.

## POINTING DEVICE

## Microsoft's Mouse 2.0 sports enhanced ergonomic design

BY TIM ZITTEL  
TECHNICAL ANALYST

Man is continually looking to invent a better mouse trap. However, Microsoft Corp. decided to take a different route and invent a better mouse instead. Although this isn't a new idea, Microsoft's Mouse 2.0 combines ergonomic improvements and an easy-to-use interface.

The new mouse is approximately a half inch larger all the way around, including the height. The buttons are larger and gently contoured to better cradle users' fingertips. A sloping rise in the center creates extra height to fit users' palms.

Microsoft claims its Mouse is equally comfortable for right- or left-handed users and suggests that you break up long work sessions by switching the mouse from one hand to the other. The setup program lets you set the buttons to which hand you are using.

I had several people, both right- and left-handed, use the mouse. Many did find it more comfortable than a definite

improvement over the previous version; however, some people thought the design felt awkward when switching between hands.

Also, those with smaller hands thought the mouse was a bit too large when centering their hands on the mouse, resulting in tired wrists. However, switching to a more comfortable position put the mouse buttons too far forward. If they used the buttons a lot, the top of the hand became sore. Perhaps Microsoft should offer their mouse in a couple of different sizes.

Everyone who used the mouse liked the Mouse Setup software. You can select different sizes and colors (black, white, and transparent) for the cursor. Other nice options included screen wrapping, snapping to the default button of a dialog box, and features for locating a small cursor and using the cursor as a magnifying glass.

Microsoft's Mouse still includes Mouse Trails, and you can adjust the length of the trails, pointer speed, and duration. You can also set the cursor to be small when idle and larger when active.

The standard sensitivity controls are also included.

Microsoft Mouse 2.0 lists for \$109 for the serial and PS/2 versions, \$125 for the bus and combination (includes both serial and PS/2 connections) versions. Microsoft, in Redmond, Wash., is at (800) 426-9400.



Left- and right-handers can use Mouse 2.0.

# Novell must handle developers carefully over AppWare

**N**ovell Inc. is so determined to make this decade the "Networking '90s" that it has decided it can't just be in the highway business. It has to get into the construction business, too.

Last week, Novell laid out AppWare: an ambitious blueprint for launching a blizzard of network applications. The strategy looks to give developers a way to assemble network applications as easily as building toys with Lego blocks.

But observers warn that to be successful, Novell will have to walk a tightrope: become the best friend of application-hungry network owners without becoming the worst nightmare of the emerging development tools companies.

For this precarious act, Novell has called on Willie Tejada, director of developer relations. At 28, Tejada may be young to be presiding over what may become one of Novell's most strategic projects in years. But in youth there is agility, and that may prove an important asset. Vance McCarthy, InfoWorld's senior editor of networking, asked Tejada about the balancing act.

**InfoWorld:** How does Novell expect AppWare to make it easier for developers to write client/server applications?

**Tejada:** AppWare's primary intent will give developers a single environment to write in to order to support multiple graphical user interfaces, desktop operating systems, and network operating systems. That way, they can write their application once to the AppWare API set and be able to support Windows, NT, Macintosh, and OS/2 desktops.

In addition, AppWare provides a simple way for developers to reuse code sets, letting them — as well as in-house

developers — create new sets of network-independent applications from pieces of code already written.

**InfoWorld:** For AppWare to work, won't it have to be endorsed by those companies already providing developer tools, such as Oracle, Powersoft, and others?

**Tejada:** Yes, that's correct. And we've already been working with those companies and others to get their tools to work with AppWare.

**InfoWorld:** But these companies have their own cross-platform strategies. Even Powersoft, which endorsed AppWare at your announcement, seems a bit reluctant to endorse the entire program.

**Tejada:** It's true that Powersoft does have its own technology developed in-house for providing cross-platform tools. But the company is excited about our AppBuilder technology because it allows for object-based development of complicated applications.

**InfoWorld:** Many have suggested that the AppWare strategy will confuse commercial and in-house developers. While AppWare may save time once people know how to use it, ramping up on a new set of tools can be time consuming.

**Tejada:** We are addressing that problem. Our goal is to let users keep using the tools that they are most familiar with and provide them with the option of using AppWare-ready versions of these tools as our program goes forward. We do not intend to be in the tools business, per se.

## ONE ON ONE



**Willie Tejada**  
Director of Developer Relations  
Novell Inc.  
Provo, Utah  
Age: 28

**InfoWorld:** You say that, yet, for now, the only tools that are AppWare-ready are the Visual Builder tools from Novell. How is Novell assuring tools vendors that it will not become a threat to tools vendors' core business?

**Tejada:** We have set up a Compass program to help out both commercial and in-house developers. We do not want to be in the tools business, yet to demonstrate the concept and get devel-

opment going, we have to provide some initial technology. The Visual Builder, which comes in large part from Serius, is that product. Once we have enough other tools vendors offering graphical front-end technologies to AppWare, we will find it less important to provide this kind of product.

It's been our model to take the lead where it is necessary and then to get out of that business. We want to stay in the network services business, but we also want to expand the number of applications that are available that take advantage of those services, such as imaging, file, print, and database, as well as multimedia and telephony.

**InfoWorld:** It seems like we've heard some pieces of this message before from other vendors, even Microsoft. How will AppWare differ from Microsoft's Windows Open Systems Architecture (WOSA)?

**Tejada:** WOSA only works for Windows right now, so developers may get some time-to-market benefits in their development, but they won't get the kind of access to multiple desktops that we'll offer.

**InfoWorld:** Novell is leveraging technology from other vendors, such as Serius, STL, and HyperDesk to provide this capability. When can developers expect to see an integrated product that they can use?

**Tejada:** Our developers' release will be available in October, when we will also hold an AppWare developers conference. The final release is slated for shipment in May 1994.

## Notes From the Field / Robert X. Cringely

# How is Windows NT not like Unix? NT will outsell it, but Unix has shipped

**A**nother PC Expo, and this one was better than most. The weather was good, there were interesting things to be seen at the show, and no buildings blew up while we were there.

The highlight of our trip was probably the dinner cruise of New York Harbor on *The Highlander*. Malcolm Forbes' 151-foot yacht, Malcolm, being very much was unable to join us, but we bounced on his king-sized bed in remembrance.

**CRINGE IS A GEEK.** Well that's enough about PC Expo, because we've got some business to do. Last week in my DOS 7 item, I made the mistake of writing "FAT entry" when I meant "directory entry." In about a week, that issue of *InfoWorld* is going to work its way down the food chain to the techies, who are going to call by the hundreds to correct me.

So here's what you do, right now, go to the most technical person in your company and say, "That Cringely is so lame. He wrote 'FAT entry' when we all know it's 'directory entry.'" You get points with the technical staff, and I avoid 500 calls.

Another bit of backtracking that



seems in order is on my claim two weeks ago that heads were rolling in IBM's AIX group. In fact, the first PowerPC to hit the streets, probably this fall, will be based on AIX. Moreover, IBM is claiming that it is actually hiring people for AIX. I think what's happening is IBM is shifting some of its resources between the Advanced Workstation Division and Boca Raton, and that has caused a lot of confusion.

**REVISIONIST MARKETING.** I'll show you confusion. At PC Expo, Bill Gates said

that Windows NT is "a form of Unix." He said, "In a short time, it will be the most popular form of Unix ever." And here's the one line: "Windows NT will outsell those other incompatible versions of Unix."

Incompatible with what? With NT? Microsoft is clearly trying to reposition NT. It has decided to pretend that OS/2 doesn't even exist, even though Bill said last year that he would do OS/2 applications when IBM sold 2 million copies of the OS (they have, he won't). So Unix is now the designated competition for NT.

Well the competition can relax for a while, because Windows NT is slipping every day. The project leaders inside Microsoft are now talking about shipping at fall Comdex. Supposedly the first release candidate of Windows NT went golden last Monday, but that is pure propaganda.

Beta testers of standard NT are reporting problems with enabling serial ports using the 16-bit OPENCOM function. (The application bombs if it was developed using the standard Windows developers' kit.)

Also, 50 new copies of the NT Advanced Server version went out to

large customers having problems with earlier code.

And here's an odd one: If you go into the Win32 help file, look up system info. You'll see that among the processor types is the Intel i860. Does this mean Microsoft is doing a version of NT for this other Intel RISC chip?

**NOT VAPOR, BUT NOT REAL.** As usual, some of the best stuff at PC Expo was shown in private. Aldus showed new versions of Persuasion, FreeHand, and PhotoMaster. Symantec showed Q&A for the Mac and Windows — presumably the versions developed with Bedrock. Adobe planned to show Premiere for Windows, until Microsoft's withdrawal of Video for Windows (it wasn't selling) sent the company into a panic about possible incompatibility.

"I don't care about that," said Pammy, dragging me back to the Forbes' estate room. "Let's see if we can find Liz Taylor's underwear drawer!"

She said it, I didn't. Get something off your chest by calling me with an industry secret at (415) 312-0555; fax: (415) 358-1269; E-mail: MC@CRINGE or cringex@infoworld.com.



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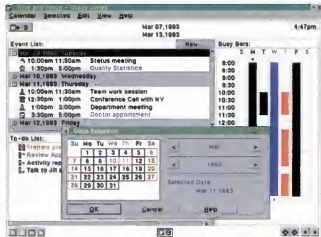
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